ENVIRONMENTAL ASSESSMENT

Alpine Forest Restoration Project

EA-NV-030-08-011

U.S. Department of the Interior
Bureau of Land Management
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BLM

I. INTRODUCTION/PURPOSE AND NEED

INTRODUCTION

The Bureau of Land Management (BLM) has prepared this Environmental Assessment on the potential effects of forest restoration on up to 532 acres of BLM administered lands in Alpine County, California, in compliance with the National Environmental Policy Act. The proposed project is part of a nation-wide initiative to restore healthy, diverse, and resilient ecosystems to conditions that minimize the potential for uncharacteristically intense fires.

More than 93% of the land base in Alpine County is either state land or public land managed by the federal government. Consequently, the County is dependant on public lands to support economic growth and viability. Approximately 19,000 acres of public land in Alpine County are administered by the BLM. Public lands in Alpine County are recognized for their high recreational values. Included is the popular 7,044-acre Indian Creek Recreation Area. The desire to enhance and protect private property, natural resources and recreation values guide management actions on BLM lands in the County.

Until the mid-1980s, the BLM's only vegetation management program in Alpine County was to suppress any wildfires, and there had not been many of those. Aesthetic and other forest values were recognized, and outdoor recreation was the primary program managed. No need had been recognized for any actions to reduce fire hazard fuels, to treat forest health problems such as disease and insects, or to maintain ecosystem diversity and wildlife habitat. The earliest recognition of such a need was in the wildlife program, when BLM biologists began a small project of clearing "browse lanes" by hand tools in bitterbrush stands that had become so densely overgrown that browse forage had become inaccessible and impenetrable to deer in an important migration area.

In 1983, foresters worked with recreation staff to address the problem of trees dying from dwarf mistletoe and bark beetles in the then-new Indian Creek Campground. In 1984, a 19,000-acre wildfire burned much of the scenic backdrop of the Indian Creek Recreation Area. The Alpine County Board of Supervisors established a Bark Beetle Committee, which evolved into the Alpine Forest Land Advisory Committee after the 1986 Fredericksburg Fire burned 6,000 acres and the 1987 Acorn Fire burned 6,000 acres and 26 homes. It was then that BLM managers initiated small projects to reduce fire hazard fuels and thin timber stands to protect forest health.

The BLM, United States Forest Service (USFS), California Department of Forestry (CDF), Alpine County and local residents remain concerned that the altered condition of forest vegetation would cause substantial damage to public and private property values and diminish the long-term sustainability of the land. In recent years, BLM has acted in cooperation with the USFS, CDF and Alpine County to complete several vegetation treatments. Since 1990, over 433 acres of BLM land in Alpine County have been treated using prescribed fire and mechanical treatments in strategic locations to reduce the severity of potential wildfires; improve timber stand health, vigor, and resistance to fire, insects, and disease; and enhance wildlife habitat (Map 4). The treatments completed to date have been a good start but forest restoration treatments are a work in progress in a changing environment and additional treatments have been identified.

PURPOSE & NEED

The forest restoration proposed in this assessment focuses on altering vegetation structure and function to lower fire danger while increasing the overall biological diversity and long-term health of the treatment areas.

The increase in the density of brush, small trees and shade tolerant tree species, such as pinyon pine and white fir, has created a multi-storied forest structure with a continuous vertical fuel arrangement. This arrangement may allow a fire normally restricted to the surface to spread into the trees and become a crown fire. Tree stands would be thinned to reduce crown fire potential, restore historic species composition, maintain or increase growth and vigor of residual trees and maintain or enhance the development, diversity and resilience of large trees. The proposed action is designed to restore fire dependent ecosystems.

The change in vegetative structure to denser, more competitive stands has also had a significant effect on wildlife habitat quality. As example, the important sage grouse habitat in Bagley and Silver King Valleys is at risk of conversion to an unsuitable vegetative composition. Tree species are encroaching into the meadow system and becoming increasingly dense on the slopes above the meadow system causing a downward trend in habitat quality. The proposed action is designed to protect or enhance special-status species habitat and protect and maintain watershed and soil integrity.

Two communities, Markleeville and Woodfords, and isolated homes and other improvements are in close proximity to the project area. Periodic severe wildfires in this fire prone landscape are considered inevitable and Alpine County has a history of large intense and sometimes destructive fires (Map 5). The most destructive fire on the Sierra Front occurred in Alpine County in 1987 when 26 homes were lost outside of Woodfords in the Acorn Fire. With increasing population in the County, the threat to communities continues to grow. The proposed project is designed to protect life and property and enhance the fire suppression capabilities for the local firefighting organizations.

LAND USE PLAN CONFORMANCE STATEMENT

Carson City Field Office Consolidated Resource Management Plan, 2001. (CCFO CRMP 2001)

Wildlife - Desired Outcomes (*CCFO CRMP 2001 pg. WLD-2*)

- Maintain and improve wildlife habitat, including riparian/stream habitats, and reduce habitat conflicts while providing for other appropriate uses.

Forestry - Desired Outcomes *(CCFO CRMP 2001 pg. FOR-1)*

- Forest and woodland management will be based on the principles of multiple use, sustained yield, and ecosystem management.

Forestry – Land Use Allocations *(CCFO CRMP 2001 pg. FOR-1)*

- Allow commercial timber sales (Markleeville and Long Valley Planning Units) consistent with VRM class designations and objectives for scenic value management.
- Commercial sales will not be allowed in the Class II VRM area (Indian Creek Recreation Lands) that is highly visible from recreation developments unless needed for disease or hazard reduction.
- Salvage and sanitation cutting of commercial timber and other cutting consistent with VRM and wildlife guidelines will be provided for in the Long Valley and Markleeville Planning Units.

Forestry – Implementation Level Decisions *(CCFO CRMP 2001 pg. FOR-2)*

- Vegetation manipulations such as chaining, burns, and chemical treatments will be allowed only after attempts have been made to sell or dispose of forest products through forestry sales programs.

Carson City Field Office Fire Management Plan, 2004. (CCFO FMP, 2004)

The Proposed Action is located in the Alpine and Slinkard Fire Management Units (NV-030-05 and NV-030-06). Management direction applicable to this proposal includes the following:

FMU Fire Management Objectives Priority Statement *(CCFO FMP, 2004 pg 99 and 113)*

- Maintain or improve the condition of the public rangelands to enhance productivity for all rangeland and watershed values. *Citation: Carson City Field Office Consolidated Resource Management Plan, 2001. (CCFO CRMP 2001 pg. LSG-1.1)*
- Maintain a sufficient quality and diversity of habitat and forage for livestock, wildlife, and wild horses through natural regeneration and/or vegetation manipulation. *(CCFO CRMP 2001 pg. LSG-2A)*
- Restore fire as an integral part of the ecosystem; improve the diversity of the vegetation, and to reduce fire hazard fuels. *(CCFO CRMP 2001 pg. FIR-2.1)*

FMU Prescribed Fire Strategy: *(CCFO FMP, 2004 pg. 102 and 116)*

- Prescribed fire may be used in a coordinated manner with cooperators in critical areas to reduce the threat of catastrophic wildfire, increase the manageability of wildfire, and maintain or improve ecosystem condition. Management action should appear to be natural and not create strong visual impacts.
- Utilize prescribed fire to modify vegetation communities and achieve fuels, habitat, watershed, and riparian objectives. Prescribed fire may be utilized to prevent pinyon and white fir encroachment into Jeffery pine and sagebrush sites, reduce fuel loads in Jeffery pine stands, create mosaic habitat patterns on a landscape scale, restore watershed functions, improve infiltration rates, and increase perennial stream flow.

Non-Fire Fuels Treatment Strategies: *(CCFO FMP, 2004 pg. 103 and 117)*

- Priority will be given to fuel treatment projects in the wildland urban interface (Markleeville, Woodford, Indian Creek Reservoir) designed to protect life and private property. Techniques to accomplish this will include thinning, chipping, mowing, mastication, and seeding of fire resistant species.
- Hazardous fuels treatment would be considered in combination with resource driven vegetation modification projects to achieve mutually beneficial vegetation, habitat, watershed, cultural resource, and fuels objectives. Hazardous fuels loads would be treated in order to reduce rates of fire spread, and the threat of escaped fires.
- Utilize mechanical, chemical, and biological treatments to modify vegetation communities and achieve fuels, habitat, watershed, and riparian objectives.
- Non-fire fuels projects may be designed to maintain, restore, or enhance high value habitat areas. Projects would generally be less than 150 acres in size.

RELATIONSHIPS TO STATUTES, REGULATIONS, AND OTHER PLANS

In 1992, the Alpine County Forest Lands Advisory Committee produced a report, Forests in Crisis: Eastern Alpine County, in which the committee addressed forest health concerns. The report recognized that the current overstocked condition of the forest is neither natural nor healthy and that current management practices would result in continuing and possibly accelerating tree mortality and associated negative impacts on the other forest resources. The report recommended numerous vegetation treatments including understory and overstory thinning and understory prescribed fire. The Committee sent letters to the governor of Nevada and president of the United States requesting an emergency declaration to permit emergency salvage and thinning operations on state and private forest lands and urging Congress to take such action in regard to lands managed by the Federal Government.

Alpine County created an implementation plan of fire elements in 1991 as the culmination of a citizen review of the 1987 Acorn Fire. The Alpine Fire Safe Council was established in 2003 through a cooperative effort of the Alpine County Board of Supervisors and the Alpine County Resource Advisory Committee. In 2007, the Alpine County Community Fire Plan was completed by the Alpine Fire Safe Council to expand on the 1991 fire implementation plan. The Alpine County Community Fire Plan assessed wildfire hazards and risks for the communities in the County and made recommendations to mitigate these risks. The plan states, "With the large amount of public land in Alpine County, much of the fuel treatment will have to be completed on public lands." "The USFS and BLM, who administer large tracts of wildland fuels in Alpine County, have planned fuels reduction projects on public lands adjacent to communities and recreation sites. Projects are planned for each year for the next 5-10 years. These projects will help reduce the chances of wildfire moving into or out of communities." "The United States Forest Service (USFS) and Bureau of Land Management (BLM) have initiated several fuels reduction projects around these communities to address these fuel loadings. A more aggressive approach to fuels treatment and reduction should be implemented."

II. PROPOSED ACTION/ALTERNATIVES

PROPOSED ACTION

The Proposed Action would implement a combination of manual, mechanical and prescribed fire treatments using a combination of service contracts, sale contracts for timber and vegetative products, public woodcutting and agency personnel on up to 532 acres to restore a forest environment with a vegetative structure that more closely resembles the historic condition (Map 1). The project would be a continuation of management practices that have been in place for the past 20 years. Vegetative treatments would involve (1) thinning brush and trees; (2) treating residual biomass; and (3) understory broadcast prescribed burning.

Treatment Activities

Manual Treatment - Manual treatment involves the use of hand tools and hand-operated power tools to cut or prune herbaceous and woody species and hand piling residual biomass. The proposed action would include 313 acres of manual treatments.

Mechanical Treatment - Mechanical treatment involves the use of wheeled and tracked vehicles with attached implements designed to fell, shred, chip, skid, pile and load herbaceous and woody species/biomass. The proposed action would include 201 acres of mechanical treatments.

Prescribed Fire - Prescribed fire treatment involves the intentional application of fire to wildland fuels using hand held firing devices under specified conditions of fuels, weather, and other variables. The proposed action would include 218 acres of prescribed fire treatments.

Chemical Treatment - Chemical treatment involves the use of sodium tetraborate dechanhydrate (commonly known as "borax") to minimize the possibility of the increase in the root disease *Heterobasidion annosus*. This treatment would only be considered in the Campground East and West units(41 acres) due to the high value Jeffrey pine trees in Indian Creek Campground if the root rot is determined locally to pose a risk at the site.

The following would apply should this treatment be used:

- Application would follow all State and Federal rules and regulations as they apply to this herbicide application.
- All Jeffrey pine stumps greater than 14 inches in diameter could be treated with Sporax™ at a rate of one pound per 50 square feet of stump surface.
- Sporax™ would be applied within 4 hours of stump creation. Sporax™ would not be applied on rainy days, upgradient from the Indian Creek campground drinking water well, or within 25 feet of live streams, or riparian vegetation, whichever distance is greater.

Treatment Unit Descriptions, Activities and Specifications: (Maps 2 and 3)

Specification Definitions

Fire Regime Condition Class

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention.

Table 1. Fire regime groups

Group	Frequency	Severity
I	0-35 years	Low/ mixed
II	0-35 years	Replacement
III	35-200 years	Mixed/ low
IV	35-200 years	Replacement
V	200+ years	Replacement/ any severity

Fire regime condition classes measure the degree of departure from reference conditions (Map 6). The three fire regime condition classes are defined as follows:

- Condition Class 1-Vegetation and fire attributes intact and functioning. The risk of losing key ecosystem components is low.
- Condition Class 2- The fire frequencies have departed by one or more return interval resulting in moderate changes in fire and vegetation attributes. The risk of losing key ecosystem components is moderate.
- Condition Class 3- The fire frequencies have departed by multiple return intervals resulting in dramatic changes in fire and vegetation attributes. The risk of losing key ecosystems components is high.

Basal Area and Canopy Density

Stand basal area measures the number and size of trees in a stand and is measured in ft ^{2} per acre. Alpine County Forest Lands Advisory Committee report stated that historical research has shown that prior to the mid 1800s the low elevation forest in Alpine County had a stocking average (basal area) of about 80 square feet per acre. Today the basal area in project area stands is greater than 130 square feet per acre with some stands over 250 square feet per acre. Canopy density is a variable in the estimation of stand volume and in the evaluation of silvicultural operations and ecological conditions. Canopy density is usually expressed as the proportion of the stand area covered by the vertical projection of the tree crowns. Thus, a canopy density of 75 percent means that the vertical projection of the tree crowns occupies 75 percent of the total area of the stand.

Unit Name: AIRPORT ROAD BEND	**Size:** 3 acres
Slope: 5-40%	**Aspect:** Southwest
Fire Regime: I	**Condition Class:** 2
Average Basal Area: N/A	**Average Canopy Density:** N/A
Description: The unit is located below Airport Road at the high point of the road. The unit is directly adjacent to treatment units that were understory prescribed burned in 1997 and thinned, lopped and scattered in 2006. The unit is only accessible by foot. The vegetative overstory is dominated by pinyon pine with an occasional Jeffrey pine. The vegetative understory consists of sagebrush, bitterbrush, perennial grasses and scattered cheatgrass.	
Treatment Activity: MANUAL	
Treatment Specifications: 1) Cut 90% or more of pinyon pine; 2) Lop and scatter cut material to lie within 16 inches of the ground.	

Unit Name: AIRPORT ROAD CENTRAL	**Size:** 17 acres
Slope: 10-30%	**Aspect:** North
Fire Regime: I	**Condition Class:** 2
Average Basal Area: N/A	**Average Canopy Density:** N/A
Description: The unit is located primarily north of Airport Road, directly east of the residences on Airport Road. Unit access would be from Airport Road. An ephemeral drainage is adjacent to the unit. The vegetative overstory consists of Jeffrey pine and pinyon pine. Dwarf mistletoe is present in the Jeffrey pine southeast of the residences. The vegetative understory consists of bitterbrush, sagebrush, manzanita, grasses and forbs.	
Treatment Activity: MECHANICAL	
Treatment Specifications: 1) Masticate 80% of the understory brush in a mosaic pattern leaving a narrow buffer mostly untreated along Airport Road; 2) Masticate pinyon pine so that no pinyon pine canopy is within 20 feet of a Jeffrey pine bole and pinyon pine canopy spacing is a minimum of 20 feet; 3) Masticate Jeffrey pine ≤ 8 inches DBH so Jeffrey pine bole spacing is a minimum of 20 feet; 4) Masticate 90% or more of the standing dead pinyon pine; 5) Products of mastication to be treated to lie within 12 inches of the ground.	

Unit Name: AIRPORT ROAD NORTH	**Size:** 7 acres
Slope: 0-35%	**Aspect:** North
Fire Regime: I	**Condition Class:** 2
Average Basal Area: 148 ft²/acre	**Average Canopy Density:** 78%
Description: The unit is located directly north of the residences off Airport Road. The unit was thinned in the early 1990s. Unit access would be from the Indian Creek Campground road. An ephemeral drainage is adjacent to the unit. The vegetative overstory is dominated by Jeffrey pine with white fir scattered throughout. The vegetative understory consists of litter and scattered bitterbrush and perennial grasses. The unit contains a significant (20 tons/acre) dead and down component (GTR-PNW-95).	
Treatment Activities: MANUAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Cut 90% or more of trees ≤ 8 inches DBH; 2) Pile and pile burn, chip and/or remove cut material and existing dead and down biomass.	

Unit Name: AIRPORT ROAD SOUTH	**Size:** 34 acres
Slope: 0-30%	**Aspect:** North
Fire Regime: I	**Condition Class:** 2
Average Basal Area: 130 ft²/acre	**Average Canopy Density:** 79%
Description: The unit is located primarily south of Airport Road, southeast of the residences on Airport Road. A portion of the unit was thinned in the early 1990s. Unit access would be from Airport Road. The vegetative overstory is dominated by Jeffrey pine with significant pinyon pine in the understory and isolated white fir. Dwarf mistletoe is present in the Jeffrey pine east of the residences. The vegetative understory consists of bitterbrush, sagebrush, manzanita, ceonothus sp., serviceberry, snowberry, perennial grasses and forbs.	
Treatment Activities: MANUAL/MECHANICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Masticate 90% of the understory brush in a mosaic pattern leaving a narrow buffer mostly untreated along Airport Road; 2) Thin/masticate Jeffrey pine to target basal area; 3) Cut/masticate 90% or more of pinyon pine; 4) Cut/masticate 90% or more of the white fir ≤ 12 inches DBH; 5) Pile and pile burn, chip, masticate and/or remove cut material; 6) Products of mastication to be treated to lie within 12 inches of the ground; 7) Understory broadcast burn following thinning and slash treatment.	

Unit Name: BAGLEY 1	**Size:** 73 acres
Slope: 0-30%	**Aspect:** West
Fire Regime: I	**Condition Class:** 2-3
Average Basal Area: N/A	**Average Canopy Density:** N/A
Description: The unit is located at the southern end of Bagley Valley, northern end of Silver King Valley. Unit access would be the road down Bagley Valley from Heenan Lake. In order to minimize resource impacts vehicles would remain on existing routes. Treatments would be implemented from mid summer through winter. The vegetative overstory consists of Jeffrey pine, pinyon pine, and Sierra juniper. The vegetative understory consists of sagebrush, bitterbrush, mountain mahogany, serviceberry, perennial grasses and forbs.	
Treatment Activities: MANUAL	
Treatment Specifications: 1) Cut/lop/scatter 90% or more of Jeffrey pine, pinyon pine and Sierra juniper in meadow; 2) Cut/lop/scatter 90% or more of pinyon pine and Sierra juniper in low foothills within 300 feet of meadow; 3) Cut/lop/scatter 90% or more of pinyon pine and Sierra juniper ≤ 6 feet tall in remainder of unit.	

Unit Name: BAGLEY 2	**Size:** 153 acres
Slope: 0-40%	**Aspect:** West
Fire Regime: I	**Condition Class:** 2-3
Average Basal Area: N/A	**Average Canopy Density:** N/A
Description: The unit is located at the southern end of Bagley Valley, northern end of Silver King Valley. Unit access would be the road down Bagley Valley from Heenan Lake. In order to minimize resource impacts vehicles would remain on existing routes. Treatments would be implemented from mid summer through winter. The vegetative overstory consists of Jeffrey pine, pinyon pine, and Sierra juniper. The vegetative understory consists of sagebrush, bitterbrush, mountain mahogany, serviceberry, perennial grasses and forbs.	
Treatment Activities: MANUAL	
Treatment Specifications: 1) Cut/lop/scatter 90% or more of trees in meadow; 2) Cut/lop/scatter 90% or more of pinyon pine and Sierra juniper in low foothills within 300 feet of meadow; 3) Cut/lop/scatter 90% or more of pinyon pine and Sierra juniper ≤ 6 feet tall in remainder of unit; 4) Cut/lop/scatter 90% or more of trees ≤ 18 inches DBH within 10 feet of springhead prisms; 5) Fell two conifers > 24 inches DBH within 10 feet of springhead prisms and leave whole; 6) Girdle 90% or more conifers >18 inches DBH within 10 feet of springhead prisms and leave standing; 7) Cut/lop/scatter 90% or more of trees within 30 feet of either edge of the spring outflow prisms from the springheads to the meadow; 8) Construct one brush/slash pile directly adjacent to each springhead prism.	

Unit Name: CAMPGROUND EAST	**Size:** 25 acres
Slope: 0-02%	**Aspect:** East
Fire Regime: I	**Condition Class:** 2
Existing Basal Area: 80 to 190 ft²/acre	**Average Canopy Density:** 70%
Description: This unit comprises the rest of the campground mentioned in the Campground West unit, where dwarf mistletoe has begun to spread from the west side, but is treatable by pruning as well as some tree removal. Not as many trees have died in this area over the years, but trees are more susceptible to mortality from both mistletoe and bark beetles due to the higher density of the second-growth Jeffrey pine overstory.	
Treatment Activities: MANUAL/MECHANICAL/CHEMICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Judiciously prune mistletoe-infested branches in the fall or summer after annual inspection; 2) Reduce stand density to a basal area of 80-120 ft²/acre by first removing mistletoe-infested trees that would not make good tree specimens after pruning. Secondly remove other lesser trees which would make less competition for superior, healthier trees; 3) To Minimize the possibility of an increase in the root disease *H. annosus*, Jeffrey pine stumps greater than 14 inches in diameter could be treated with sodium tetraborate dechahydrate (commonly known as "borax") and sold as Sporax™; 4) Dispose of wood as firewood after retaining enough logs on the ground for landscaping, habitat, and vehicle control; 5) Pile and pile burn, or chip cut material. A modest amount of small branches and pine needles may be left scattered evenly on the ground to replenish natural ground cover and be used as campfire kindling. Pile burning would not take place between Campground Road and Indian Creek Reservoir.	

Unit Name: CAMPGROUND ROAD	**Size:** 5 acres
Slope: 0-10%	**Aspect:** Flat
Fire Regime: I	**Condition Class:** 2
Average Basal Area: 180 ft²/acre	**Average Canopy Density:** 81%
Description: The unit is located between the Indian Creek Campground Road and Indian Creek Reservoir. Unit access would be from the Indian Creek Campground road. Indian Creek Reservoir is adjacent. The vegetative overstory consists of Jeffrey pine and pinyon pine. The vegetative understory consists of sagebrush, bitterbrush, perennial grasses, scattered cheatgrass and forbs.	
Treatment Activities: MANUAL/MECHANICAL	
Treatment Specifications: 1) Cut/masticate 90% of the understory brush in a mosaic pattern; 2) Cut/masticate 90% or more of pinyon pine ≤ 12 inches DBH; 3) Cut pinyon pine regardless of size where tree canopy is within 20 feet of a Jeffrey pine bole; 4) Cut/masticate Jeffrey pine ≤ 12 inches so bole spacing is a minimum of 20 feet; 5) Chip, masticate and/or remove cut material; 6) Products of mastication to be treated to lie within 12 inches of the ground.	

Unit Name: CAMPGROUND SOUTH	**Size:** 11 acres
Slope: 0-30%	**Aspect:** North
Fire Regime: I	**Condition Class:** 3
Average Basal Area: N/A	**Average Canopy Density:** N/A
Description: The unit is located between the Indian Creek Campground and the residences off Airport Road. The unit is directly adjacent to a unit that was understory prescribed burned in 1999. Unit access would be from the Indian Creek Campground road. An ephemeral drainage is adjacent to the unit. The vegetative overstory consists of open Jeffrey pine with pockets of white fir and pinyon pine. The Jeffrey pine is heavily infected with dwarf mistletoe. The vegetative understory consists of sagebrush, bitterbrush, manzanita, ceanothus sp., mountain mahogany, perennial grasses and forbs.	
Treatment Activities: MECHANICAL	
Treatment Specifications: 1) Masticate 90% of the understory brush in a mosaic pattern; 2) Masticate 90% or more of the pinyon pine; 3) Masticate Jeffrey pine and white fir ≤ 12 inches DBH so tree boles are a minimum of 20 feet from Jeffrey pine and white fir > 12 inches DBH; 4) Products of mastication to be treated to lie within 12 inches of the ground.	

Unit Name: CAMPGROUND WEST	**Size:** 16 acres
Slope: 0-30%	**Aspect:** East
Fire Regime: I	**Condition Class:** 3
Average Basal Area: 80 ft²/acre	**Average Canopy Density:** 55%
Description: The unit is the west side of the Indian Creek Campground main camping loop and includes the timbered slope uphill of the campground. The site has lost many trees over the last 30 or more years due to heavy infection of dwarf mistletoe and secondary agents including several bark beetle outbreaks. A 1986 biological evaluation by the USDA Intermountain Region Forest Service Forest Health staff provided the basis for pruning and thinning treatments to contain the mistletoe. In this portion of the campground, however, pruning is no longer practical, because all of the trees are so severely infected. The vegetative overstory is dominated by second-growth Jeffrey pine with a few pinyon pines in the understory with ground cover of mostly pine needles. Tree seedlings and saplings have been planted in the campground for several years, and most of the young Jeffrey pines have been infected from the overstory. The few white firs planted have done well.	
Treatment Activities: MANUAL/MECHANICAL/CHEMICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Retain older Jeffrey pines for shade, screening, and scenery as long as they live; 2) Remove dead Jeffrey pines that pose hazards to humans and the facilities; 3) To Minimize the possibility of an increase in the root disease *H. annosus*, Jeffrey pine stumps greater than 14 inches in diameter could be treated with sodium tetraborate dechahydrate (commonly known as "borax") and sold as Sporax™; 4) Plant seedlings of trees native to the general area, including firs, junipers, pinyon pines and incense cedars, which are not susceptible to the same species of dwarf mistletoe as Jeffrey pine is. Eventually plant Jeffrey pines again after the threat of infection is greatly reduced; 5) Some snag stumps may be left high to contribute visual screening and aesthetics; 6) Dispose of wood as firewood after retaining enough logs on the ground for landscaping, habitat, and vehicle control; 7) Pile and pile burn, or chip cut material. A modest amount of small branches and pine needles may be left scattered evenly on the ground to replenish natural ground cover and be used as campfire kindling. Pile burning would not take place between Campground Road and Indian Creek Reservoir.	

Unit Name: CARSON RIVER TRAIL	**Size:** 52 acres
Slope: 0-30%	**Aspect:** Northeast
Fire Regime: I	**Condition Class:** 2
Average Basal Area: N/A	**Average Canopy Density:** N/A
Description: The unit is located south of the two residences off Airport Road, above and below the Carson River Trail. The unit is directly adjacent to a unit that was thinned in the early 1990s and understory prescribed burned in 1999. Unit access is from two locations off of Airport Road. An ephemeral drainage is adjacent to the unit. The vegetative overstory consists of Jeffrey pine, pinyon pine and white fir. The Jeffrey pine is heavily infected with dwarf mistletoe. The vegetative understory consists of sagebrush, bitterbrush, manzanita, ceanothus sp., mountain mahogany, perennial grasses and forbs. A significant dead and down component is present in the white fir stands.	
Treatment Activities: MANUAL/MECHANICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Cut/masticate 90% of the understory brush in a mosaic pattern; 2) Cut/masticate 90% or more of pinyon pine ≤ 12 inches DBH; 3) Thin/masticate Jeffrey pine and white fir ≤ 12 inches DBH so tree boles are a minimum of 20 feet from Jeffrey pine and white fir > 12 inches DBH; 4) Pile and pile burn, chip, masticate and/or remove cut material and existing dead and down biomass; 5) Products of mastication to be treated to lie within 12 inches of the ground.	

Unit Name: CURTZ LAKE	**Size:** 15 acres
Slope: 5-40%	**Aspect:** East
Fire Regime: I	**Condition Class:** 2
Average Basal Area: 130 ft²/acre	**Average Canopy Density:** 79%
Description: The unit is located northwest of Curtz Lake. The unit was thinned, the tree boles removed and the slash pile burned in 2005. Unit access would be from Curtz Lake on the Summit Lake road. Curtz Lake is adjacent. The vegetative overstory is dominated by Jeffrey pine with an occasional Sierra juniper. Dwarf mistletoe was observed in the Jeffrey pines on the northern end of the unit. The vegetative understory consists of occasional bitterbrush, mountain mahogany, grasses and forbs.	
Treatment Activities: MANUAL/MECHANICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Thin Jeffrey pine to target basal area; 2) Remove cut material > 8 inches in diameter; 3) Pile and pile burn, chip, masticate and/or remove slash; 4) Understory broadcast burn following thinning and slash treatment.	

Unit Name: HIGHWAY 89 WEST	**Size:** 8 acres
Slope: 0-40%	**Aspect:** East
Fire Regime: I	**Condition Class:** 3
Average Basal Area: 188 ft²/acre	**Average Canopy Density:** 77%
Description: The unit is located east of Turtle Rock State Park and west of Highway 89. The unit is directly adjacent to the park and a unit masticated in 2006. There is no road access to this unit. An ephemeral drainage parallels Highway 89 between the highway and the unit. The vegetative overstory is dominated by Jeffrey pine with an occasional white fir or Sierra juniper. The vegetative understory is dominated by bitterbrush with manzanita and mountain mahogany scattered.	
Treatment Activities: MANUAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Cut 90% of the understory brush in a mosaic pattern; 2) Cut 90% or more of Jeffrey pine and white fir ≤ 6 inches DBH; 3) Pile and pile burn cut material; 4) Understory broadcast burn following thinning and pile burning.	

Unit Name: INDIAN CREEK 4	**Size:** 8 acres
Slope: 0-30%	**Aspect:** Southwest
Fire Regime: I	**Condition Class:** 2
Average Basal Area: 150 ft²/acre	**Average Canopy Density:** 74%
Description: The unit is located east of the junction of Highway 89 and Airport Road. The unit has been thinned and understory prescribed burned in 2007. Unit access would be from Airport Road. The vegetative overstory is dominated by Jeffrey pine with an occasional pinyon pine in the canopy openings. Dwarf mistletoe is present adjacent to the unit but the unit itself appears uninfected. The vegetative understory consists of occasional perennial grasses and forbs.	
Treatment Activities: MANUAL/MECHANICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Thin Jeffrey pine to target basal area; 2) Remove cut material > 8 inches in diameter; 3) Pile and pile burn, chip, masticate and/or remove slash; 4) Understory broadcast burn following thinning and slash treatment.	

Unit Name: MILLBERRY	**Size:** 24 acres
Slope: 0-25%	**Aspect:** North
Fire Regime: I	**Condition Class:** 2
Average Basal Area: N/A	**Average Canopy Density:** N/A
Description: The unit is located south of Turtle Rock County Park. The unit, directly adjacent to the park and in an area masticated in 2006, is located upwind from the park. Unit access would be through the park. The vegetative overstory is dominated by Jeffrey pine. The vegetative understory is dominated by low bitterbrush with manzanita, grasses and forbs scattered.	
Treatment Activities: PRESCRIBED FIRE	
Treatment Specifications: 1) Understory broadcast burn.	

Unit Name: MILLBERRY 2 North and South	**Size:** 42 acres
Slope: 0-20%	**Aspect:** East
Fire Regime: I	**Condition Class:** 2-3
Average Basal Area: 146 ft²/acre	**Average Canopy Density:** 77%
Description: The unit consists of two discontinuous sub-units located west and southwest of Turtle Rock County Park. The unit, directly adjacent to the park and a unit masticated in 2006, is located upwind from the park. Unit access would be through the park and from a road located on the private property boundary north of the unit. The vegetative overstory is dominated by Jeffrey pine with white fir scattered throughout. The Jeffrey pine stand is comprised of pockets of large trees and pockets of dense saplings. Heavy dwarf mistletoe is present in pockets of the Jeffrey pine with other areas unaffected. An ephemeral drainage runs through the northern sub-unit which has a few aspen trees growing adjacent. The vegetative understory is dominated by bitterbrush with manzanita, ceanothus sp., perennial grasses and forbs scattered.	
Treatment Activities: MECHANICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Masticate 90% of the understory brush in a mosaic pattern; 2) Masticate Jeffrey pine and white fir ≤ 8 inches DBH so Jeffrey pine bole spacing is a minimum of 20 feet; 3) Products of mastication to be treated to lie within 12 inches of the ground; 4) Understory broadcast burn following mastication treatment..	

Unit Name: RESERVOIR	**Size:** 11 acres
Slope: 0-20%	**Aspect:** Northeast
Fire Regime: I	**Condition Class:** 3
Average Basal Area: 150 ft²/acre	**Average Canopy Density:** 90%
Description: The unit is located south of Indian Creek Reservoir along Airport Road. The unit has been thinned and understory prescribed burned in 1999. Unit access would be from Airport Road. An ephemeral drainage runs through the unit. The vegetative overstory is Jeffrey pine. The vegetative understory consists of scattered perennial grasses.	
Treatment Activities: MANUAL/MECHANICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Thin Jeffrey pine to target basal area; 2) Remove cut material > 8 inches in diameter; 3) Pile and pile burn, chip, masticate and/or remove slash; 4) Understory broadcast burn following thinning and slash treatment.	

Unit Name: SUMMIT LAKE	**Size:** 11 acres
Slope: 15-35%	**Aspect:** East
Fire Regime: I	**Condition Class:** 2
Average Basal Area: N/A	**Average Canopy Density:** N/A
Description: The unit is located between Curtz and Summit Lakes. The unit was masticated in 2006. Unit access would be from Curtz Lake on the Summit Lake road. The vegetative overstory is dominated by white fir with an occasional Jeffrey pine and pinyon pine. Heavy dwarf mistletoe is present in the Jeffrey pine. The overstory was dominated by Jeffrey pine but the majority of the Jeffrey pine trees have recently died and fallen which resulted in a heavy deep dead and down fuel bed. The mastication completed in 2006 reduced the depth of that dead and down fuel bed from approximately 36 to 12 inches. The vegetative understory consists of scattered bitterbrush, manzanita, ceanothus sp., perennial grasses and forbs. The dead and down fuel loading is currently approximately 40 tons per acre (GTR-PNW-95).	
Treatment Activities: MANUAL/MECHANICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Pile and pile burn and/or remove dead and down material.	

Unit Name: SUMMIT RIDGE	**Size:** 3 acres
Slope: 25-40%	**Aspect:** East
Fire Regime: I	**Condition Class:** 2
Average Basal Area: 290 ft²/acre	**Average Canopy Density:** 94%
Description: The unit is located between Curtz and Summit Lakes. The unit is directly adjacent to units pile burned in 2003 and masticated in 2006. Unit access would be from Curtz Lake on the Summit Lake road. The vegetative overstory is dominated by Jeffrey pine with an occasional white fir. Dwarf mistletoe was observed in the Jeffrey pines on the low end of the stand. No understory vegetative is present.	
Treatment Activities: MANUAL/MECHANICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Thin Jeffrey pine to target basal area; 2) Remove cut material > 8 inches in diameter; 3) Pile and pile burn, chip, masticate and/or remove slash.	

Unit Name: VEGETATIVE TRAIL	**Size:** 14 acres
Slope: 0-35%	**Aspect:** East
Fire Regime: I	**Condition Class:** 2
Average Basal Area: 260 ft²/acre	**Average Canopy Density:** 93%
Description: The unit is located on either side of Airport Road west of the vegetative trailhead and Curtz Lake. Unit access would be from Airport Road. The vegetative overstory is dominated by Jeffrey pine with scattered incense cedar, pinyon pine, Sierra juniper, and white fir. Dwarf mistletoe is present in the southern end of the stand on private land but the unit itself appears unaffected. The vegetative understory consists of occasional serviceberry, snowberry, manzanita, grasses and forbs.	
Treatment Activities: MANUAL/MECHANICAL/PRESCRIBED FIRE	
Treatment Specifications: 1) Thin Jeffrey pine to target basal area; 2) Cut 90% or more of the white fir and pinyon pine; 3) Remove cut material > 8 inches in diameter; 4) Pile and pile burn, chip, masticate and/or remove slash; 5) Understory broadcast burn following thinning and slash treatment.	

General Treatment Specifications

- If a more stringent treatment specification appears in the unit description that specification would be used when implementing the treatment.
- Treatment of Jeffrey pine, white fir, pinyon pine and mixed conifer stands would entail thinning trees up to 24 inches in diameter. Two Jeffrey pine trees would be felled greater than 24 inches in the Bagley 2 treatment unit.
- Forestry, fuels management, and other staff specialists would collaborate to implement treatments in units involving issues relevant to their programs.
- In Jeffrey pine stands a target density or basal area of 60-120 square feet per acre would be established.
- Due to the current very dense stocking of trees in some stands, multiple entries may be required to gradually reach target basal area and some post-treatment basal areas may remain higher than the target.
- Where possible thinning treatments would encourage un-even aged stands.
- Specifications for individual treatment units may vary somewhat to address site characteristics.
- White fir and pinyon pine would be removed from the understory of Jeffrey pine in Jeffrey pine stands except where species variety is desirable.
- Thinning would be determined by canopy position (i.e., intermediate and suppressed trees would be selectively thinned), which would result in uneven spacing of residual trees.
- To the extent possible, thinning would be designed to restore a broad variety of seral stages, stand ages, openings and tree clumping.
- Slash would be treated by piling and burning, lopping and scattering, chipping, masticating and/or removing as a biomass product.
- Brush would be thinned in a mosaic pattern so that untreated patches, favoring large mountain mahogany and bitterbrush plants, are retained throughout.
- Fall would be the preferred season for understory broadcast prescribed burning but such burning could also be conducted in the spring.
- Winter would be the preferred season for pile burning.
- Long-term objectives for desired conditions in future decades would be considered in implementing treatments.
- Natural regeneration of trees and other plants would be provided for in treatments entailing vegetation removal.
- Forest health protection actions to treat trees and stands for disease and insect attacks would be addressed as needed in future environmental documents if not addressed in this analysis.

Resource Protection Measures

- All incense cedar, Sierra juniper and aspen would be retained except within the Bagley 1 and 2 units where Sierra juniper would be cut.
- Retain mature and splayed top Jeffrey pine along ridgelines.
- Jeffrey pine and white fir with exfoliating bark would be retained.
- Jeffrey pines with large mistletoe witch brooms would be retained.
- Any tree with a stick nest would be retained.
- To the extent practicable rotting stumps would be retained.
- Some cull trees would be retained as part of the residual if present in a unit. (Northern Prairie Wildlife Research Center 2007)

- A minimum of three existing snags per acre and three down logs per acre, of the largest diameters present, would be retained and signed as necessary to discourage unauthorized removal.
- Woody debris would not be placed in or removed from drainages.
- A 50% minimum canopy density would be retained within a 50 foot zone on either side of Millberry Creek and adjacent to Curtz Lake.
- An Equipment Limitation Zone (ELZ) for any and all Class III and Class IV watercourses of at minimum 25 feet where sideslope steepness is less than 30%, and at minimum 50 feet where sideslope steepness is 30% or greater.
- Slash piles would be constructed a minimum of 25 feet away from seasonally flowing ephemeral streams and 100 feet from the high water mark as defined by change in vegetation on all bodies of water.
- Mechanical equipment would be kept a minimum of 100 feet from the high water mark as defined by change in vegetation on all bodies of water and perennial streams.
- Where slash piles are created, one slash pile per acre would be constructed as a wildlife pile, signed, and retained.(Appendix H)
- Brush piles would be cleared of wildlife before burning.
- No new roads would be constructed.
- Landing construction would be minimized by utilizing existing/natural landings where practicable.
- Skid trails would be designed to avoid seasonally flowing ephemeral streams.
- After use, skid trails and landings would be restored by restoring the contour and applying mulch and/or seeding with native species where necessary.
- After use, prescribed fire hand lines would be restored by restoring the contour and water barring as necessary.
- All equipment moved onto public land would be free of soil, seeds, and vegetative matter or other debris that could contain or hold seeds.
- Monitor temporary routes and sign accordingly if monitoring indicates unauthorized motorized use is occurring.
- Best management practices to minimize soil erosion and protect water quality (Appendix I) would be followed.
- All state and federal regulations would be followed.
- When applicable, notices would be posted at Indian Creek Reservoir and at Curtz Lake informing the public at least 14 days in advance of the proposed activities.

Monitoring

Monitoring would be conducted within the treatment areas before, during, and after treatment implementation. The monitoring plan would be completed in such a way as to meet all the requirements identified in the Lahontan Regional Water Quality Control Board Category 2 waiver for Timber Harvest and Vegetation Management Projects. Monitoring would consist of surveys to:

1. Ensure that the initial treatment objectives are met;
2. Evaluate vegetation/fuel load recovery;
3. Identify invasive species for subsequent treatment.
4. Determine the effectiveness of management measures in controlling discharges of sediment and in protecting water quality.

Post Treatment Maintenance

The treatment areas would be managed to prevent new noxious weed infestations, excessive generation of dust and soil erosion and protect reseeding efforts. In order to achieve these objectives the following management actions would be enacted:

1. After the proposed treatments the project areas would be monitored for noxious weed populations. Any new infestation locations would be entered into the Carson City Field Office's GIS data-base for future treatments using integrated management techniques, including the use of herbicides, as defined in the Carson City Field Office annual weed treatment plan.

2. If accelerated soil erosion rates are anticipated or discovered in treatment areas appropriate erosion control measures such as water baring, contour furrowing, wood chip and/or slash dispersal would be constructed prior to seasonal project completion.

NO ACTION ALTERNATIVE

Under the No Action Alternative the forest restoration project identified in the proposed action would not be implemented and natural processes, except for wildland fire, would continue.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

SCOPING AND ISSUE IDENTIFICATION

The Carson City Field Office Fuels Program specialists identified the proposed action. Carson City Field Office management reviewed the proposed project and an interdisciplinary team was assigned in November, 2007. The environmental assessment was reviewed by the interdisciplinary team of Bureau specialists in February, 2008.

Scoping letters were mailed out on April 9, 2008. Letters were sent to: Alpine County Board of Supervisors, Alpine Fire Safe Council, Alpine County Public Works, California Department of Fish and Game, Cal Fire Amador-El Dorado Unit, California Regional Water Quality Control Board, Humbolt-Toiyabe National Forest, Friends of Hope Valley, Great Basin Unified Air Pollution Control District, Washoe Tribe of Nevada and California and interested individuals living in Alpine County. The comment period was open until May 7, 2008.

The Alpine Forest Restoration Project was placed on the consent agenda for the Alpine County Board of Supervisors meeting May 6, 2008.

PROPOSED ACTION

General Setting

The project area is located in eastern Alpine County and contains 21 discontinuous treatment units. The proposed treatment units are in the eastern Sierra Nevada in a diverse mix of vegetation consisting of Jeffrey pine, white fir, pinyon pine, mountain mahogany, bitterbrush, manzanita, ceanothus**,** sagebrush, grasses and forbs. Elevation ranges between 5600 and 6600 feet. Aspect varies. Slope ranges between 0% and 40%. Average precipitation is 24 inches per year. Specific information about each unit can be found in the treatment description section of the proposed action.

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

Appendix 5 of BLM's NEPA Handbook (H-1740-1) identifies Critical Elements of the Human Environment that are subject to requirements specified by statute or executive order and must be considered in all BLM environmental documents. The table below lists the Critical Elements and their status in the project area:

Table 2. Critical Elements of the Human Environment

Critical Element	Not Present	Present/Not Affected	Present/May Be Affected	The following rationale was used to determine that Critical Elements present in the area would not be affected as a result of implementation of the Proposed Action
Air Quality			X	
Areas of Critical Environmental Concern	X			
Cultural Resources			X	
Environmental Justice	X			
Farm Lands (prime or unique)	X			
Floodplains	X			
Invasive, Nonnative Species			X	
Migratory Birds			X	
Native American Religious Concerns		X		A letter of consultation including maps and a description of the proposed treatments has been provided to the Washoe Tribe of Nevada and California in February, 2008 no concerns were identified.
Threatened or Endangered Species			X	
Wastes, Hazardous or Solid	X			
Water Quality (Surface/Ground)			X	
Wetlands/Riparian Zones		X		All wetlands and riparian areas are excluded from treatment as described in APPENDIX I - Soil Water and Air program Best Management Practices
Wild and Scenic Rivers		X		There is no federal designation of Wild and Scenic Rivers on the Carson River.
Wilderness		X		There is no designated Wilderness within the project area, however; treatment units are .1 miles outside the Carson-Iceberg Wilderness Study Area boundary and 1.2 miles outside the Slinkard Wilderness Study Area boundary.

RESOURCES PRESENT BUT NOT AFFECTED (other than Critical Elements)

The following resources, which are not Critical Elements of the Human Environment as defined by BLM's Handbook H-1740-1, are present in the area. The BLM has evaluated the potential impact of the Proposed Action on these resources and has determined that although the resources are present, they would not be affected by the Proposed Action or Alternatives. Rationale for dismissing these resources from further discussion in the document are as follows:

SOILS

Since the treatment areas are primarily located on relatively gentle slopes, the soil types are only slightly to moderately susceptible to erosion, some vegetative cover would remain in place, areas of bare soil created by the treatments would not be large or continuous, treatments would be spread over a 3-6 year time period, and appropriate post treatment management soil erosion control measures would be implemented where needed, soil erosion is not expected to increase substantially on a project wide basis.

RESOURCES PRESENT AND BROUGHT FORWARD FOR ANALYSIS (Critical and non-Critical Elements)

The following resources are present in the area and may be affected by the Proposed Action.

AIR QUALITY

AFFECTED ENVIRONMENT

The Federal government and the State of California's Air Resources Board (ARB) have each established ambient air quality standards for several criteria air pollutants. No monitoring data is available for pollutants in the County. Emission inventory data is estimated annually. Alpine County has good air quality and does not exceed National standards for any criteria pollutants. The ARB makes State area designations for ten criteria pollutants: ozone, suspended particulate matter (PM10), fine suspended particulate matter (PM2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles. The County exceeds the State standards for suspended particulate matter (PM10).

The Great Basin Unified Air Pollution Control District (District) is responsible for air quality monitoring, regulation and enforcement in Alpine County. The district has developed a smoke management program for the purpose of minimizing adverse air quality impacts related to smoke from prescribed burning within the District's jurisdiction in Inyo, Mono and Alpine Counties. In accordance with the District's smoke management program a smoke management plan (SMP) is required to be completed and submitted to the District for review and approval prior to performing a prescribed burn. Once approved, the SMP serves as a conditional approval to burn. Ignition of a prescribed burn can only occur on ARB authorized burn days.

Federally designated Class I airsheds cover wilderness areas over 5,000 acres designated as wilderness prior to the enactment of the Clean Air Act in 1977. Class II airsheds cover all other forest lands, including wilderness areas designated after 1977, with the exception of new acres added to existing Class I areas. One federally designated Class I airshed, the 105,165 acre Mokelumne Wilderness, is located in the vicinity (2.5 miles) from the project area.

Sensitive receptors to dust and smoke in the project area would be Airport Road, Highway 89, Indian Creek Campground, Turtle Rock County Park, and two residences on Airport Road.

ENVIRONMENTAL CONSEQUENCES

Proposed Action

The potential direct, indirect, and cumulative effects on air quality of the Proposed Action are expected to be minor and would be minimized by conformity to established ARB protocols. The Proposed Action would result in a localized short-term affect on air quality in the project vicinity as a result of smoke generated from prescribed burning and exhaust and fugitive dust emissions generated by equipment and power tools.

Smoke - The Proposed Action would have minor adverse effects on air quality as a result of prescribed burning; however, the Proposed Action is expected to result in long-term benefits to air quality because of decreased smoke emissions generated during uncontrolled wildfire events. The expected smoke emissions generated by the proposed understory and pile prescribed burning are expected to be at least one-third less than those generated by an uncontrolled wildfire event if no fuel reduction actions are taken.

Exhaust - The Proposed Action would have minor adverse effects on air quality through the generation of exhaust emissions from equipment and power tools, such as mastication equipment and chainsaws. Emissions generated during implementation are individually and cumulatively minor and short term, and would not result in adverse cumulative air quality effects.

Dust - The Proposed Action would have minor adverse effects on air quality through the generation of dust from equipment, such as vehicles and mastication equipment. Equipment would be working infrequently on exposed soil and any dust generated would not remain airborne for any length of time.

No Action Alternative

The No-Action Alternative would result in no smoke, exhaust or dust emissions being generated in the short term. Without disturbance the probability of a crown fire would increase over time. Eventually a stand replacing crown fire would occur, resulting in greater emissions that could potentially create an adverse impact to the air quality in Alpine County.

CULTURAL RESOURCES

AFFECTED ENVIRONMENT

Prehistoric occupation in the northern Sierra Nevada and western Great Basin span approximately 12,000 years of human adaptation to environmental change. Five time periods have been identified for the western Great Basin: Fluted Point Period/Washoe Lake Phase (11,500-10,000 B.P.); Pre-Archaic/Tahoe Reach Phase (10,000-8,000 B.P.); Early Archaic Period/Spooner Phase (8,000-5,000 B.P.); Middle Archaic Period/Early to Late Martis Phase (5,000-3,000 B.P.); and Late Archaic Period/early to Late Kings Beach Phase (13,000-700 B.P.). These period/phases are indicative of changes in the environment, land use, and activities as identified by changes in artifact types utilized during procurement of various resources.

Cultural resources that may be identified are related to the following activities: plant procurement (seeds, roots, medicine, basketry); hunting (rabbit, deer and mountain sheep); fishing; procurement lithic materials and trade. Generally, cultural resources associated with these types of activities are lithic and groundstone scatters, drive lines/hunting blinds, quarries, artifact types indicative of trade (ocean shell,

variety of obsidian, plant materials) as well as isolated artifacts. Plant procurement activities may not result in the identification of cultural resources on the ground especially the collection of plant foods and medicines, however the list of cultural resources have been identified during previous surveys.

Historically the area has been settled since the mid-19th century. Cultural resources associated with settlement patterns associated with ranching, mining and logging are historic refuse, roads, fence lines, irrigation features, milling refuse, and architectural features (foundations and privies).

ENVIRONMENTAL CONSEQUENCES

Proposed Action

Twenty one treatment areas have been proposed and seventeen have been previously surveyed for cultural resources. During the previous surveys, both prehistoric and historic cultural resources were identified. Prior to implementation of the treatments cultural resource staff would identify cultural resources to be avoided dependent upon treatment type, site eligibility as evaluated for the National Register of Historic Places or Native American concerns as identified during consultation. The proposed treatments for Bagley 1 and 2 are exempt under the State Protocol Agreement between the California State Director of the Bureau of Land Management and the California State Historic Preservation Office, 2004, Appendix D, Class B Activities, B7. Prior to implementation of the treatment of the Millberry 2 North and Highway 89 areas, a Class III cultural resource survey would be conducted for the 33 acres not previously surveyed.

No Action Alternative

No ground disturbance would occur under the No-Action Alternative; therefore no Class III cultural resource survey would be needed.

FEDERALLY LISTED SPECIES

AFFECTED ENVIRONMENT

Although federally listed species within the project area occur in California, the Reno, Nevada office of the U.S. Fish and Wildlife Service (USFWS) administers listed species that occur on the east slope of the Sierra Nevada Range. The following federally listed species occur or have potential habitat within the general project area:

Table 3. Federally listed species and habitats associated with the Alpine Forest Restoration Project

Species Common Name	Scientific Name	Federal Listing Designation	General Location In Project Area
Lahontan Cutthroat Trout	*Oncorhynchus clarki henshawi*	Threatened	Indian Creek & Reservoir, Bagley Valley
Fisher	*Martes pennanti*	Candidate	Specific structures of conifer & hardwood forest
Yosemite Toad	*Bufo canorus*	Candidate	Riparian
Mtn Yellow-Legged Frog	*Rana mucosa*	Candidate	Riparian

(USFWS 2006, www.fws.gov/nevada/protected_species/index.html-2007, Mellison 2008) *

There are no federally listed threatened or endangered plant species nor any species proposed for federal listing in any of the project areas (Tonenna 2008).

Habitats needed by federally listed species that do or could occur within the project area are described in Appendix A.

ENVIRONMENTAL CONSEQUENCES

Proposed Action

The main goal of the proposed treatments is to reduce the potential of catastrophic wildfire. Catastrophic wildfire could burn large areas of Alpine County. Such a fire would be devastating for federally listed species and habitats associated with the Carson River Watershed or beyond. With treatment, the chance of a catastrophic wildfire is reduced. With the proposed treatment, LCT waters could be spared the possible high sediment loading and increased temperatures that accompany catastrophic wildfire. The risk of losing wet areas important to Yosemite toad and leopard frog would be reduced. Reducing catastrophic fire risk could prevent the Carson Drainage population of LCT from being upgraded in federal listing while allowing for it's recovery and could prevent upgrading of listing for Yosemite toad.

Many of the treatment specifications and resource protection measures that would be applied to each unit would protect federally listed species and habitats. These would also protect species from impacts caused during implementation of the proposed treatment. Additionally, several of the units proposed for treatment on Alpine County BLM administered lands were designed specifically to enhance habitat for federally listed species as well as reduce fuels hazards. Some of the units were designed specifically to mitigate impacts that were identified early in project design. And some of the units won't affect either federally listed species or their habitats and there wasn't an opportunity to enhance habitat for listed species.

It was determined that there would not be an effect to federally listed threatened species or habitats as a result of the proposed action being implemented. There would be no effect on federally listed candidate species.

The following table shows the general effect of each proposed treatment unit on the four federally listed species that occur and / or have habitat within the project area:

Table 4. General effects of proposed treatment units to federally listed species within the Alpine Forest Restoration project area, Alpine County, CA

Unit Name	Species			
	LCT threatened sp	**Fisher** candidate sp	**Mtn YL Frog** candidate sp	**YoseToad** candidate sp
Airport Road Bend				
Airport Road Central				
Airport Road North				
Airport Road South				
Bagley 1			**I**	**I**
Bagley 2			**I**	**I**
Campground East	**M**		*	*
Campground Road	**M**		*	*
Campground South				
Campground West	**M**		*	*
Carson River Trail				
Curtz Lake			**M**	**M**
Highway 89 West				
Indian Creek 4				
Millberry				
Millberry 2 South				
Millberry 2 North		**I**		
Reservoir				
Summit Lake				
Summit Ridge				
Vegetative Trail			**M**	**M**

I = improve, treatment designed to enhance habitat
M = mitigated, treatment design has been altered to protect species / habitats
Blank = neutral, treatments won't improve or negatively affect species / habitats because the species and/or habitats don't occur in that unit

***** = although these units occur adjacent to water, the historic, long-term recreational use makes these sites unlikely habitat for amphibians

A discussion of the improvements and mitigation to federally listed species and habitats shown in the above table is provided in Appendix E.

No Action Alternative

The main goal of the treatment is to reduce the potential of catastrophic wildfire. Without the treatment, it is only a matter of time before a catastrophic wildfire alters a vast amount of landscape for many years. If this occurred, federally listed species habitats could be significantly altered because the fire wouldn't stay within the boundaries of the treatment units. The magnitude and duration of the effects of a catastrophic wildfire could be large and long-term.

If no treatments were done, existing conifers and conifer encroachment into the springhead, springbrook and riparian area associated with the spring complex on the Bagley units would eventually dry these water sources (Szaro et al 1999). Open water and subsurface water would be lost. Riparian vegetation would be

lost or greatly reduced in area and / or species diversity. Benefits to mountain yellow-legged frog and Yosemite toad would not occur. Wet habitats supporting northern leopard frog and Yosemite toad could be significantly altered and / or destroyed. Not implementing the proposed action could be significant to federally listed species and habitats occurring in the area. It could result in an upgrading of at least Yosemite toad whose habitat is confined to the general area.
If no treatment were done on Millberry 2 North where multiple entries can recruit large diameter trees along that drainage, a potential travel corridor for fisher would not be enhanced. If fisher travel corridors currently exist, these could be destroyed.

Catastrophic wildfire wouldn't stay within the boundaries of the treatment units and could burn over occupied LCT habitat. LCT waters could experience high sediment loading with is a negative impact.

Under this alternative, there would be no possibility of impacting federally listed species or damaging habitats either from the residual vegetation effects or through implementation. However, selecting the no action alternative would be likely to adversely affect LCT because of the eminent threat of catastrophic wildfire. Selecting this alternative would likely result in a trend toward federal listing or loss of viability for the federal candidate species for the same reason.

FIRE MANAGEMENT

AFFECTED ENVIRONMENT

The project area is included in the Alpine and Slinkard fire management units of the Carson City Field Office. Markleeville and Woodfords are listed on the Federal Register as communities threatened by wildfire. In addition to the above communities, there are several federal, state and private campgrounds and dispersed residential areas within the project area that would be at risk in the event of a wildfire.

Fire regime condition class (FRCC) measures the degree of departure from reference conditions, possibly resulting in changes to key ecosystem components, such as vegetation characteristics (species composition, structural stage, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances, such as insect and disease mortality, grazing, and drought. The fire regime in the treatment areas can be characterized as high frequency, low intensity fires. The National Fire Plan and Healthy Forest Act dictate that the federal agencies use FRCC as criteria for planning projects. The FRCC represents a relative measure of how far an area is from its historical fire regime. The three fire regime condition classes are categorized using the following criteria: FRCC 1 represents ecosystems with low (<33 percent) departure and that are still within the estimated historical range of variability during a specifically defined reference period; FRCC 2 indicates ecosystems with moderate (33 to 66 percent) departure; and FRCC 3 indicates ecosystems with high (>66 percent) departure from reference conditions. Map 6 shows FRCC for the surrounding area.

The FRCC at some vegetated sites is moving from condition classes 2 or 3 to condition class 1, because the fuel levels have been reduced either by recent wildfire or recent fuel-reduction treatments. The current threat wildfire doing damage to plants and upsetting plant communities in those areas is not great, because fire intensities and spread rates can be expected to be reduced to levels that are not very harmful and can be managed or stopped. At many other sites, however, the FRCC continues to increase. The threat of fire spreading through the vegetation in a devastating way remains high, because fuels are accumulating over time, and nothing has been done to reduce that FRCC. The risk of loss only increases over time.

All the vegetation in the area is subject to fire. There is a logical relationship between frequency of fires and fire intensity. Each plant species has adaptive means to survive in a fire-adapted ecosystem. However, fires have not been allowed to burn freely, due to the ability of the managing agency to prevent fires that start from growing larger, out of control, and damaging natural resources and human improvement in a way that would not be beneficial in the public interest. That presents a quandary, though, because without fire's natural and prehistoric role of shaping plant communities and reducing fire hazard fuels, fuel levels build to levels so high that even modern, high-technology fire management would eventually not be able to suppress the fire that grows large on hot, windy days, especially when fire management resources might already be engaged in battling numerous other concurrent fires in the area and around the country.

ENVIRONMENTAL CONSEQUENCES

Proposed Action

The overall effect of the Proposed Action would result in the intended consequences of reducing the risks of catastrophic wildfire and its adverse impacts to the values at risk in the project area. As a result of hazard fuel reduction on strategic sites, wildfires which do burn could be expected to do less damage to the ecosystem and also be more readily managed. The proposed action is designed to either reduce or maintain the condition class for each treatment unit. The proposed action would be expected to decrease the FRCC in the treatment units. Over time low intensity high frequency understory burning would be reintroduced into these units resulting in a more natural fire regime consistent with pre-settlement conditions.

No Action Alternative

If treatments to reduce fire hazard fuels were not implemented as described in the Proposed Action and as mandated by the National Fire Plan, heavy impacts caused by wildfire would result when high fire danger conditions are such that fire management capabilities are not sufficient to manage fires to protect the resources and values at risk.

FOREST HEALTH

AFFECTED ENVIRONMENT

All of the tree species in the area are susceptible to attacks by insects and disease. Dwarf mistletoe (*Arceuthobium campylopodum*) is a native parasitic plant that can attach and live inside the wood of host Jeffrey and ponderosa pine trees in the area. It can kill those trees when the competition between pines for water and other resources is so great that the stressed tree may not be able to produce enough nutrients to sustain both itself and the mistletoe. Timber stand density directly affects the ability of individual trees to produce enough food to survive and still support mistletoe. More dense stands have higher stress levels per tree than more open stands and so are more vulnerable to mortality of individual trees. Mistletoe is just another stress agent for an individual tree. Mistletoe can also cause abnormal "broom" growths that provide special habitat niches where insectivorous birds can feed.

Several species of bark beetles naturally feed on trees in various ways. In general, the beetles attack trees through the bark and feed on the cambium layer between the wood and the bark. The tree's natural defense is to "bleed" sap out of the wound, and the bark beetles are thereby prevented from invading the tree. If a tree is stressed by drought and competition with other trees for water, sap production may not be great enough to wash all the beetles out of the wound, and the beetles may prevail inside the tree. Tree

mortality is caused by insect boring all around the tree trunk and girdling, severing the tree's ability to transport water and nutrients vertically. Vulnerability to attacks by bark beetles increases as timber stand density and therefore tree competition increases. In more open stands, individual trees receive more resources to survive than they would in more dense stands and so are better able to defend against bark beetle attacks.

Annosum root rot is a fungal disease that can commonly spread through the interconnected root systems of Jeffrey and ponderosa pine trees. While the root rot is widespread on the west slope of the Sierra Nevada and the coast, it is rare in the yellow pines on the east side. It gains access to roots by spores landing on freshly cut stumps and can kill many trees on a site, especially where trees are close together and trees are being cut. The spores only blow for about a mile of vulnerability from a source and for part of the year, so it is not difficult to survey and determine the presence of the pest in a treatment area (Guyon 2008).

ENVIRONMENTAL CONSEQUENCES

Proposed Action

Damage to timber stands from bark beetles and disease would be checked by the ability to apply the treatments identified in the proposed action which are known to be effective. Those natural agents of mortality would still always exist in the plant communities but can be kept in balance and prevented from wiping out large tracts of trees.

The USDA Forest Service has published Human and Environmental Health Risks Associated with the Use of Borax (2006) on tree stumps to minimize the spread of annosum root rot after trees have been felled. That assessment concludes, "The use of Sporax in the control of annosum root disease does not present a significant risk to humans or wildlife species under most conditions of normal use, even under the highest application rate. . . . There is no basis for asserting that systemic toxic effects to workers or the general public would result from either acute or longer-term exposures, except by direct consumption. Borax can cause eye irritation. Quantitative risk assessments for irritation are not derived; however, from a practical perspective, eye irritation is likely to be the only overt effect as a consequence of mishandling Sporax. This effect can be minimized or avoided by prudent industrial hygiene practices during the handling of the compound. . . . " "For exposures considered in this risk assessment, with the exception of the accidental exposure of a child *via* consumption of Sporax from tree stump, all hazard quotients are below the level of concern. For worker exposure from granular Sporax spilled on the lower legs and hands, hazard quotients are well below the level of concern."

"For terrestrial species, risk associated with the application of Sporax to tree stumps appear to be very low. . . . For aquatic animals and plants, hazard quotients marginally exceed the level of concern for amphibians for the worst-case accidental spill of 25 pounds of Sporax into a small pond." "In fish and aquatic invertebrates, acute exposure to borax and boric acid appears to have a relatively low order of toxicity." "Boron is an essential trace element for terrestrial plants. The amount of boron required to produce optimal growth and development varies tremendously between species and even between strains of the same species. However, excess boron can lead to the development of phytotoxicity."

Given the low likelihood that Sporax would need to be used at all, the very small quantities involved if it were used, and the level of care in chemical handling that would be employed, there is a very low risk of any adverse environmental effect from this feature of the Proposed Action.

No Action Alternative

More trees would die from bark beetles and dwarf mistletoe than would need to if the known practical measures proposed were not taken to reduce the susceptibility of trees to them.

GENERAL WILDLIFE

AFFECTED ENVIRONMENT

The project area has good wildlife diversity due to the elevation changes within it, the variety of habitat types and topographical features. However, the current trajectory appears to be downward for diversity. On a landscape scale, the eastern Sierra Nevada conifer forest represents a strip of unique habitat surrounded by millions of acres of pinyon-juniper woodlands in the Great Basin and oak savannahs in California. On a watershed scale, the conifer forest in the eastern Sierra Nevada range is even-aged in structure and mature in age (Bernand 2007). In general, even-aged forests aren't conducive to the highest diversity for wildlife. While mature aged conifers are certainly good wildlife habitat for some species, the highest diversity in species comes from a landscape scale forest that has non-forest inclusions, young, mature and old-growth tree communities (Raish 1997). On the current trajectory, some conifer areas would convert to woodlands and conifer dependent wildlife species would decline in abundance and diversity. Several key terrestrial and aquatic wildlife habitats occur within the general project area. These are described in Appendix B.

The general project area is an important mule deer use area. The Carson River Deer Herd uses portions of the project area at least part of the year. Winter and summer ranges as well as migration corridors have been identified in the area (ND 2007). This deer herd is considered stable to declining, as are most western deer herds, due in part to land management practices that have precluded fire (http://www.dfg.ca.gov). Mule deer need a high quality diet of forbs and shrubs. Mountain big sagebrush, mountain mahogany, snowberry, bitterbrush and most forbs are representative key forage species for mule deer. Mule deer use some grasses during spring green-up. The quality of deer summer range is extremely important because body condition going into winter determines a deer's ability to survive more than winter browse (Peek and Krausman 1995). Mule deer summer range that does exist, is in good condition. Mule deer winter range is in good condition. However, much of the summer and winter ranges are being taken over by forest and woodland species, due in part, to lack of periodic fire that would maintain them.

No pronghorn or bighorn sheep occur in the general project area.

Black bears are common within the project area. Small caves, large logs and other special features are used for dens and winter hibernation although in open winters bears may hibernate for only a short time or not at all. Bears are dependent on having a steady source of roots, insects, small mammals and herptiles as staple foods. Good condition, open habitats provide these foods. Forests and woodlands are expanding into areas which, in the past, provided the highest quality and poundage of foods needed by bears. This is due in part to lack of fire that would maintain open areas and downed log areas.
Mountain lion populations cycle with the mule deer herd. Lions can be found in any habitat used by mule deer. When deer numbers are low, lion numbers drop. Mountain lion predation on mule deer will not cause a healthy mule deer population to decline (Wallmo 1981). However, if a mule deer population is low and habitat is in poor or in short supply, mountain lions can keep deer at the lower level (Newsome et al 1988). This effect could be occurring because amounts of prime mule deer habitat are declining due to forest and woodland encroachment.

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Wild turkeys occur within the project area however, no roosting or gobbling sites have been identified. This bird uses seeds, nuts and insects as its main food items. Open meadow gobbling sites are key areas for this species reproduction and mature / decadent Jeffery pine are key habitat areas for this game bird (www.natureserve.com). The Jeffrey / PJ interface or transition area is a crucial turkey area when found on a ridgeline and especially when near water. Splayed top pines are especially used for roosting.

Historically, sage grouse were found in suitable habitat throughout the treatment areas. There are no known leks in the general project areas, however nesting habitat occurs north of Indian Creek and in the Bagley Valley area. Sage grouse within the project area are part of the Mono/Lyon population segment which has been the subject of several petitions to be listed under the Endangered Species Act, and may qualify as a Distinct Population Segment. The Greater Sage-Grouse Conservation Plan for Nevada and Eastern California, June 30, 2004, Appendix L – Pine Nut Mountains PMU Plan covers this population. One objective in Appendix L includes the following objective:

- Remove pinyon and juniper trees and reestablish big sagebrush on sites that previously supported big sagebrush. (Axtell 2008).

Conifers now occur within the rich organic soils of the Bagley Valley springheads and are encroaching into the spring brook and riparian areas associated with the spring complex. Historically, this encroachment was controlled by periodic natural wildfire. These trees can uptake and transpire water which is needed to maintain water flow and riparian/ wet meadow vegetation species (Szaro et al 1999). Eventually, the wetted area containing riparian vegetation would shrink as water flow declines until the spring complex is overtaken by the surrounding upland vegetation – mainly sagebrush. Loss of any brooding habitat for the Mono sub population would be important.

Mountain quail are present and recent wetter years have produced good populations of this species in montane habitats (www.dfg.ca.gov). Populations are highly weather dependent. These birds benefit from riparian vegetation being adjacent to shrub lands. This bird uses flowers, new growth on shrubs and insects found in riparian / shrub lands.

ENVIRONMENTAL CONSEQUENCES

Proposed Action

Catastrophic wildfire could alter or eliminate key wildlife and game habitats for a long time. This would affect local wildlife diversity and game availability, but wouldn't be important on a larger scale for any species except sage grouse. Preventing catastrophic wildfire destruction of nesting / brooding Mono sub-population sage grouse in Bagley Valley could prevent this species from being upgrading to federal listing.

Habitat for general wildlife populations consist of large areas such as a watershed or mountain range. It isn't confined to the boundaries of a project area. When impacts are analyzed or management done for wildlife species, one has to look at the entire landscape without its artificial boundaries to see the real picture of wildlife habitat impacts or existing conditions. For this reason, the following analyses were completed using coarse and fine-filters (Marcot et al 1994).

As forests mature and pinyon-juniper encroaches into conifer areas, understory species are being shaded out. General wildlife species would benefit from the proposed treatments because shrub and grass dominated areas would be maintained as a habitat type (Bock and Finch 1997). Conifer in the treatment areas won't convert to pinyon-juniper – the conifer habitat would be maintained which would maintain

conifer dependent species. Dry meadows within the forest are being taken over by trees due to a lack of nature wildfire that would maintain these. The proposed treatments would maintain or increase the availability of forbs, early grasses and shrubs needed by deer and black bear. Dry meadows would be maintained which would benefit both species. The maintenance of dry meadows would benefit wild turkey as these are needed for gobbling sites associated with reproduction. Additionally, mitigation is in place to retain decadent Jeffrey pine where known turkey roost sites occur. Although the proposed treatments won't directly affect mountain lions, benefits to mule deer would provide an indirect benefit to the lions through maintenance of a healthy food source. When viewed as a landscape within the watershed, the treatment units would form a compact habitat of younger aged trees – a habitat type which is currently in short supply. Diversity of general wildlife would be maintained or could increase.

The Bagley 1 and 2 units were designed specifically to benefit sage grouse. Conifers would be removed from the springhead and spring brook. This would maintain the water flow which in turn, maintains the riparian vegetation associated with this spring complex (Szaro et al 1999). Sage grouse brooding habitat would be greatly enhanced by treatment of these two units (Axtell 2008). The Mono sub- population of sage grouse is undergoing a status review by the U.S. Fish and Wildlife Service as of winter/spring 2008. Any type of habitat enhancement for this sub-population could help relieve the need for federal listing. If the species is federally listed, the proposed habitat enhancement could assist in stabilization and recovery of the population. Mountain quail would benefit from the maintenance of openings that produce shrubs and forbs that provide food for this species. Because of the importance splayed top Jeffrey pine are for turkey roosting, mitigation for units containing potential roost sites has been made.

The proposed borax treatments wouldn't affect general wildlife or game species directly or indirectly (USFS ND).

Impacts associated with the treatment process are different than impacts associated with residual habitat. Implementation impacts are short-term but may affect individuals of species whose habitat would be benefited in the long-term. All of the species listed may occur within the treatment units at various times of the year to perform various activities. Spring burning, mastication or hand cutting could disturb individuals of the species listed. Mitigation for treatment of the Bagley units has been written which would confine treatment times to late summer, fall or winter since the treatments are being done specifically to benefit grouse. Mitigation for the other species has been written to try to perform treatments from mid-summer through winter. However, because fuels reduction is the main goal of the treatment, the current year threat of catastrophic wildfire must be weighted against the loss of annual production for general wildlife and game. If treatment had to be done during the spring season, only some of that year's production in the specific project units would be lost at the most. That wouldn't be important to the local populations.

No Action Alternative

As forests mature, understory species would be shaded out in the dry Jeffrey pine stands. Pinyon-juniper encroachment would reduce the occurrence of understory shrubs and herbaceous species. Additionally, these woodland tree species would displace the conifers and this habitat type would be reduced. General wildlife diversity would be lessened and habitat for game species won't be as good as it could be. However, if the proposed action isn't implemented, the lost benefits won't be important to any general wildlife populations with one exception.

The Mono sub- population of sage grouse is undergoing a status review by the U.S. Fish and Wildlife Service as of winter/spring 2008. Although not implementing the Bagley Valley units of the proposed

action wouldn't cause federal listing of this population, there would be a lost opportunity to benefit the habitat of a sub-species whose continuance is in question.

Catastrophic wildfire could alter or eliminate key wildlife and game habitats for a long time. This would affect local wildlife diversity and game availability, but wouldn't be important on a larger scale.

The implementation process wouldn't occur and so, would eliminate the possibility of displacing individuals, causing loss of that year's young or having another direct effect to individual wildlife. However, this benefit isn't important to local or regional populations.

INVASIVE NON-NATIVE SPECIES

AFFECTED ENVIRONMENT

In the general area of the proposed fuel treatment projects there have been yellow starthistle, diffuse knapweed, and perennial pepperweed infestations. The yellow starthistle infestation at the Indian Creek Reservoir has been eliminated by hand pulling; no populations have been identified during the past three years. The South Tahoe Public Utilities District has been spraying the pepperweed at the reservoir dam, and the diffuse knapweed at Turtle Rock County Park has been also sprayed, probably by the Alpine County-Upper Carson River Cooperative Weed Management Area. It is not known whether these two infestations have been eradicated at this time.

ENVIRONMENTAL CONSEQUENCES

Proposed Action

Disturbed sites would be susceptible to invasive, nonnative species invasion, primarily cheatgrass on dry south and west slopes. After the proposed treatments the project areas would be monitored for noxious weed populations. Any new infestation locations would be entered into the Carson City Field Office's GIS data-base for future treatments using integrated management techniques, including the use of herbicides. Invasive, nonnative species may compete with native species and contribute to a decline in ecological conditions within treatment units for a short period until the native species once again dominate.

No Action Alternative

Under the No Action Alternative, no disturbance would occur due to the proposed treatments. The short-term impacts as described for the Proposed Action would not occur. Conversely, none of the long-term benefits of reduced risk of wildfire would be realized.

RECREATION

AFFECTED ENVIRONMENT

Bureau of Land Management lands in Alpine County are recognized for their high recreational values. Overall, BLM management decisions reflect the public desire to enhance and protect these recreation values. Historically, these decisions have centered on facility/campground development and land acquisition and retention in an effort to preserve the character, setting and recreation resources and

opportunities unique to this area. Recreation opportunities present in the county include dispersed (undeveloped and unstructured) recreation activities such as dry camping, hunting, exploring, horse-back riding, snowshoeing and cross-country skiing. Off-road vehicle (ORV) opportunities are limited due mainly to topography and are typically focused around exploring, hunting, and trail riding and occur on primitive roads and trails.

Located off Airport Road, the Curtz Lake Environmental Study Area was completed during the summer of 1973 by the Youth Conservation Corp and the BLM. Designed for use by the general public and school groups, the study area consists of three connecting self-guiding thematic interpretive trails and a parking area. The interpretive trail system receives little to moderate use during the spring through fall months. The interpretive signs and trails are 30 years old and are in need of repair and/or redesign.

ENVIRONMENTAL CONSEQUENCES

Proposed Action

The sounds of chainsaws, heavy mastication equipment and vehicles related to the proposed treatments would be audible to the public in the vicinity of the treatment areas while work is being performed. However, seasonal limitations on the use of chainsaws, and mechanical shredders in the vicinity of developed recreation sites during the high use period of Memorial Day through Labor Day would limit noise impacts on the public. In areas where concentrated use by the public exists, modifying vegetation densities can affect traffic and use patterns for a given area.

Interpretive signs and trail improvements along the Curtz Lake "vegetative" trail may be damaged, however; considering that there are plans to relocate this trail alignment to the north side of the road, potential impacts to these features would be insignificant.

No Action Alternative

Under the No Action Alternative, no disturbance would occur due to the proposed treatments. The short-term impacts in the vicinity of the developed recreation sites as described for the Proposed Action would not occur. Conversely, none of the long-term benefits of reduced risk of wildfire would be realized.

SPECIAL STATUS SPECIES

AFFECTED ENVIRONMENT

<u>Nevada and California BLM Sensitive Species & State of California Status Species</u>
BLM Manual 6840 defines sensitive species as "…those species not already included as BLM Special Status Species under (1) Federal listed, proposed or candidate species; or (2) State of Nevada listed species. Native species may be listed as "sensitive" if it: (1) could become endangered or extirpated from a state or significant portion of its range; (2) is under review by the FWS/NMFS; or (3) whose numbers or habitat capability are declining so rapidly that Federal listing may become necessary, or (4) has typically small and widely dispersed populations; (5) inhabits ecological refugia, specialized or unique habitats; (6) is state-listed, but is better conserved through application of the BLM sensitive species status." It is BLM policy to provide sensitive species with the same level of protection that is given federal candidate species.

The major objective of this protection is to preclude the need for federal listing. Because Alpine County is located in California, but administered from Nevada, both Nevada and California sensitive species lists apply to the general project area. The list of Nevada and California BLM sensitive species that occur or are likely to occur in the Project area is shown in Appendix C (BLM 2003). www.blm.gov/ca/pdfs/pa_pdfs/biology_pdfs/SensitiveAnimals.pdf;www.blm.gov/ca/pdfs/pa_pdfs/biology_pdfs/SensitivePlants.pdf). No California BLM sensitive plant species were found to have habitat in the proposed treatment areas (Tonenna 2008).

At present, it is only a matter of time before a catastrophic wildfire alters a vast amount of landscape for many years. If this occurred, sensitive species diversity would be dramatically altered. Additionally, the magnitude and duration of the effects of a catastrophic wildfire could be large and long-term. As forests mature and pinyon-juniper encroaches into conifer areas, understory vegetation species are being are shaded out. Dry meadows within the forest are being taken over by trees due to a lack of nature wildfire that would maintain these. The general landscape of the watershed and beyond is dominated by even-aged, mature conifers (Bernand 2007) which doesn't provide good wildlife diversity (Raish 1997). The trajectory for sensitive species in the general project area is less diversity and less abundance through loss of habitat due to forest maturation and encroachment.

Neo-tropical Migratory Birds

On January 11, 2001, President Clinton signed Executive Order 13186 (Land Bird Strategic Project) placing emphasis on conservation and management of migratory birds. The species are not protected under the Endangered Species Act, but most are protected under the Migratory Bird Treaty Act of 1918. Management for these species is based on Instruction Memorandum – IM 2008-050 dated December 18. 2007. There are no Important Bird Areas (IBA) associated with the general project area. There are no identified important wintering areas within the general project area (McIvor 2005).

Although located in California, the project area's bird habitats most closely resemble the Intermountain West Avifaunal Biome described by Partners in Flight (PIF). The Intermountain West is the center of distribution for many western birds. Over half of the biome's Species of Continental Importance have 75% or more of their population here. Many breeding species from this biome migrate to winter in central and western Mexico or in the Southwestern biome (Beidleman 2000). The species of concern that could occur in the general project area are shown in Appendix D (BLM 2007).

As forests mature and pinyon-juniper encroaches into conifer areas, understory vegetation species are being are shaded out. Dry meadows within the forest are being taken over by trees due to a lack of nature wildfire that would maintain these. The general landscape of the watershed and beyond is dominated by even-aged, mature conifers (Bernand 2007) which doesn't provide good wildlife diversity (Raish 1997; www.natureserve.com). The ecotone area where P-J is encroaching supports fewer birds than either type by itself (Northern Prairie Wildlife Research Center 2007). The trajectory for sensitive species in the general project area is less diversity and less abundance through loss of habitat due to forest maturation and encroachment.

ENVIRONMENTAL CONSEQUENCES

Proposed Action

Nevada and California BLM Sensitive Species & State of California Status Species

The main goal of the treatment is to reduce the potential of catastrophic wildfire. Implementing the proposed action could be important to local and possibly regional populations of BLM sensitive and State of California Status species by reducing the possibility of catastrophic wildfire.

In general, BLM Sensitive and State of California Status Species would benefit from the proposed treatments because shrub and grass dominated areas would be maintained as a habitat type. Conifer in the treatment areas won't convert to pinyon-juniper – the conifer habitat would be maintained. When viewed as a landscape within the watershed, the treatment units would form a compact habitat of younger aged trees – a habitat type which is currently in short supply. Habitat fragmentation on a landscape scale would be minimal. Diverse forage sources would be maintained as understory vegetation is retained. Some individuals may be displaced during implementation, but populations would be unaffected by implementation. Diversity of BLM and California Status species can be maintained through this landscape scale habitat improvement – which is beneficial. Table 6 shows the longer-term effects of the residual forest structure after treatment on the Nevada and California BLM sensitive species that could occur in or near the general project area.

Table 6. General effects of the residual forest structure to Nevada and California BLM sensitive and State of California Special Status Species within the Alpine Forest Restoration project area, Alpine County, CA

BLM Sensitive Species	Unit Name																		
	Airport Rd	Airport Rd	Airport Rd	Airport Rd S	Baglev 1	Bagley 2	Campgr E	Camper Rd	Campgr S	Campgr W	Carson R Tr	Curtz Lake	Hwy 89 West	Indian Cr 4	Milberry 2 S	Milberry 2 N	Reservoir	Summit Lake	Summit Rdg	Vegetative Tr
Sierra Alligator Lizard					I	I				I		I				I		I	I	
No Leopard Frog					I	I														
Golden Eagle							M	M	M	M		M		M			M	M	M	
Sage Grouse					I	I														
Cal Spotted Owl																I				I
No Goshawk																				
Long-eared Owl		A		A			A		A	A	A	A		A				A	A	A
Juniper Titmouse	A	A	A	A			A	A	A		A	A	A	A		A	A		A	A
Gray Vireo	A	A		A				A	I	I					I	I				A
Pinyon Jay	A	A		A				A	I	I					I	I				A
Lewis's Woodpecker	M	M	M	M						A	M	M	M	M		I	M	M	M	M
Mountain Quail	I	I	I	I			I	I	I	I	I	I	I	I	I	I	I	I	I	I
Red-naped Sapsucker																I				
Black Rosy-Finch																				
Cooper's Hawk	I			I				I			I									I
Sharp-shinned Hawk										I										
Osprey										A										
Merlin										A										
Vaux's Swift	M	M	M	M						A	M	M	M	M		M	M	M	M	M
Long-billed Curlew																				
Snowy Plover																				
Pallid Bat																				
Spotted Bat																				
Long-eared Myotis	M	M	M	M						A	M	M	M	M		M	M	M	M	M
Yuma Myotis																				
Silver-Haired Bat										A										
Long-legged myotis	M	M	M	M							M	M	M	M		M	M	M	M	M
Big Brown Bat										A						M				
Hoary Bat	M	M	M	M						A	M	M	M	M		M	M	M	M	M
Brazillian FT Bat																				
Mono LakeCheckerspot	I	I	I	I			I	I	I	I	I	I	I	I	I	I		I	I	I

(BISON ND, Block and Finch 1997, Finch 1993, Floyd 2007, Neel 1999, NDOW 2001, Wildlife Action Plan Team 2006, www.natureserve.com

I = improve = treatment designed to enhance habitat or would benefit indirectly from treatment
A = affected by habitat change
BLANK = neutral, treatments won't improve or negatively affect species or habitats because 1) the species and/or habitats don't occur in that unit, 2) the treatment won't change basic life cycle needs related to food, reproductive habitat, shelter habitat
M = mitigated = treatment design has been altered to protect species / habitats

A narrative describing the specific mitigation, improvements, blanks and adverse affects is shown in Appendix F.

Neo-tropical Migratory Birds

The main goal of the treatments is to reduce the potential of catastrophic wildfire. Without the treatment, it is only a matter of time before a catastrophic wildfire alters a vast amount of landscape for many years. If this occurred, migratory bird use of the Carson River Watershed or beyond would be dramatically altered. Additionally, the magnitude and duration of the effects of a catastrophic wildfire could be large and long-term. Implementing the proposed action could be important to local and possibly regional populations of migratory birds.

IM 2008-050 recommends that impacts to migratory bird habitats, individuals and populations are addressed (BLM 2007). This IM recommends filter levels of analysis to make determinations of impacts from. Impacts to individuals are to be identified, but whether a negative or positive effect / impact is occurring is based on the population as a whole. This population can be a local, regional, national or Continental. This IM lists Species of Concern to be singled out for analysis. In general, migratory birds either won't be affected or would benefit from the proposed treatments; impacts should be minimal. Benefits would come from shrub and grass dominated areas being maintained as a habitat type. Conifer in the treatment areas won't convert to pinyon-juniper – the conifer habitat would be maintained. Diverse forage sources would be maintained as understory vegetation is retained. When viewed as a landscape within the watershed, the treatment units would form a compact habitat of younger aged trees – a habitat type which is currently in short supply – in the midst of a sea of mature conifers. Habitat fragmentation on a landscape scale would be minimal (Faaborg et al 1992). Large diameter trees are being retained; standing snags are being retained as part of the prescriptions. Treatment prescriptions call for "leave trees" to be clumped or irregularly spaced rather than evenly spaced, which is beneficial (Reynolds 1992). Diversity of migratory bird species now using the general area can be maintained through this landscape scale habitat improvement.

As stated, birds don't confine their use to arbitrary areas such as the proposed treatment areas. For this reason, the Carson River Watershed, which contains the treatment units and other untreated habitat, was used for analysis since this more closely represents actual migratory bird habitat at a minimum. Impacts to migratory bird species would be minimal because only 2% of the Jeffrey pine, 1% of the pinyon pine and 0.2% of the white fir acres in the Carson watershed would be treated (Barker 2008). Some bird species would always occur in the treatment area – the treatment would only enhance conditions for some species at the expense of others (Raish 1997). When the treatment area and entire Carson Watershed are taken together, all species expected for the area would still have a place. Some individual birds may be displaced during implementation, but populations would be unaffected by implementation.

The species of concern shown in Appendix D represent a variety of birds that need specific nesting substrate, food sources or other habitat structure. An analysis of impacts to the migratory bird Species of Concern is a good representation of impacts to similar species. Table 5 shows the longer-term effects of the residual forest structure after treatment on the migratory bird species of concern that could occur in or near the general project area.

Table 7. General effects of residual forest structure on migratory bird species of concern within the Alpine Forest Restoration project area, Alpine County, CA

Migratory Birds of Special Concern	Unit Name																			
	Airport Rd	Airport Rd	Airport Rd	Airport Rd S	Bagley 1	Bagley 2	Campgr E	Campgr Rd	Campgr S	Campgr W	Carson R Tr	Curtz Lake	Hwy 89 W	Indian Cr 4	Milberry 2 S	Milberry 2 N	Reservoir	Summit Lake	Summit Rdg	Vegetative Tr
Sage Grouse					**I**	**I**														
Virginia's Warbler	**I**	**I**	**I**	**I**			**A**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**
Gray Vireo	**A**	**A**		**A**				**A**	**A**	**I**	**A**									**A**
Pinyon Jay	**A**	**A**		**A**				**A**	**A**	**I**	**A**									**A**
Northern Goshawk														**I**		**I**		**I**	**I**	**I**
California Spotted Owl																**I**				**I**
Band-tailed Pigeon			**A**	**A**			**A**		**A**	**I**	**I**				**I**	**I**				**A**
WH Woodpecker																**I**				**I**
Snowy Plover																				
American Avocet																				
Long-billed Curlew																				
Northern Pintail																				
Mallard																				
Lewis Woodpecker	**M**	**M**	**M**	**M**						**A**	**M**	**M**	**M**	**M**		**I**	**M**	**M**	**M**	**M**
Rufous Hummingbird					**I**	**I**	**A**	**I**		**I**		**I**	**I**			**I**				
Red-napped Sapsucker																**I**				
Williamson Sapsucker																**I**				

(BISON ND, Finch 1993, Floyd 2007, Neel 1999, NDOW 2001, Wildlife Action Plan Team 2006, www.natureserve.com)

I = improve = treatment designed to enhance habitat or would benefit indirectly from treatment
A = affected by habitat change
BLANK = neutral, treatments won't improve or negatively affect species or habitats because 1) the species and/or habitats don't occur in that unit, 2) the treatment won't change basic life cycle needs related to food, reproductive habitat, shelter habitat

A narrative describing the specific improvements, blanks and adverse affects is shown in Appendix G.

No Action Alternative

Nevada and California BLM Sensitive Species & State of California Status Species

The main goal of the treatment is to reduce the potential of catastrophic wildfire. Without the treatment, it is only a matter of time before a catastrophic wildfire alters a vast amount of landscape for many years. If this occurred, species diversity would be dramatically altered. Additionally, the magnitude and duration of the effects of a catastrophic wildfire could be large and long-term. Not implementing the proposed action could be important to local and possibly regional populations of BLM sensitive and State of California Status species.

If the proposed action wasn't implemented, there would be lost opportunity to enhance the habitats of several BLM sensitive species that would be expected to use the general treatment areas. None of these opportunities is important to local or Continental populations with one exception.

Conversely, there would be no possibility of accidentally felling occupied exfoliating bark trees or snags. Mistletoe brooms would remain intact in the treatment areas. Thinning wouldn't occur nor would pinyon

removal. Some BLM sensitive species would benefit from not having the project implemented. However, this benefit isn't important to local or Continental populations.

The implementation process wouldn't occur and so, would eliminate the possibility of displacing individuals, causing loss of that year's young or having another direct effect to individual wildlife. However, this benefit isn't important to local or Continental populations.

Neo-tropical Migratory Birds

The main goal of the treatment is to reduce the potential of catastrophic wildfire. Without the treatment, it is only a matter of time before a catastrophic wildfire alters a vast amount of landscape for many years. If this occurred, species diversity would be dramatically altered. Additionally, the magnitude and duration of the effects of a catastrophic wildfire could be large and long-term. Not implementing the proposed action could be important to local and possibly regional populations of migratory birds.

If the proposed action wasn't implemented, there would be lost opportunity to enhance the habitats of several migratory bird species of concern that would be expected to use the general treatment areas. None of these opportunities is important to local or Continental populations with one exception.

Conversely, there would be no possibility of accidentally felling occupied snags. Some migratory bird species of concern would benefit from not having the project implemented. However, this benefit isn't important to local or Continental populations.

The implementation process wouldn't occur and so, would eliminate the possibility of displacing individuals, causing loss of that year's young or having another direct effect to individual wildlife. However, this benefit isn't important to local or Continental populations.

VEGETATION

AFFECTED ENVIRONMENT

The low elevation eastern Sierra Nevada is a unique transition zone where the Sierra Nevada ecoregion overlaps with the Great Basin ecoregion. As a result we see a mixing of the species from each ecoregion within this transition zone. The vegetation on BLM land in Alpine County is typical of this transition zone and consists of a diverse mix of Jeffrey pine, white fir, pinyon pine, incense cedar, Sierra juniper, mountain mahogany, bitterbrush, manzanita, ceanothus sp., sagebrush, grasses and forbs. As hard discrete boundaries between ecological communities are rare **, the presence of pinyon pine and white fir along the eastern Sierra Nevada is an important and natural component of the vegetation communities.

Cheatgrass is an annual exotic species that may be present wherever there has been ground disturbance. In some parts of the country, cheatgrass has come to dominate large areas where native flora has been lost in plant communities. In Alpine County, however, composition of plant communities is varied enough that cheatgrass monocultures have not developed. It has increased on a few sites after fires in recent years, but enough other native species are present there to prevent any situations of cheatgrass dominance.

****** ecological boundaries encompass much more than physical characteristics . While it does include physical characteristics, *ecological* boundaries include spatial structure characteristics, temporal and function characteristics. These characteristics blend with the physical characteristics to form ecological boundaries. However, the ecological boundary shifts depending on the question one is asking. For example, a distinct vegetation change may be apparent on the ground. However, the *function* of that area for a wildlife species for instance, may extend into an adjacent vegetation type. The ecological boundary line for this species becomes fuzzy and would be different for another species. Current research by leading scientists in the nation state that ecological boundaries may be unbroken or perforated by all four of these characteristics and these boundaries are dynamic at any given time (Strayer et al 2003).

ENVIRONMENTAL CONSEQUENCES

Proposed Action

The pattern of vegetation in the project area can be expected to become more diverse and begin to approach characteristics of the historical range of variability typical of a natural fire-adapted ecosystem, because of the resource objectives and design criterion of the Proposed Action. The specifications of treatment by unit as described are realistic and achievable.

No Action Alternative

Ecological diversity would continue to decline in the plant communities if measures in the Proposed Action are not implemented to restore the natural mosaic landscape pattern of vegetation. Characteristics of individual vegetation patches would become less varied as time passed. That diversity would be lost even more after large, catastrophic fires occur.

VISUAL RESOURCES

AFFECTED ENVIRONMENT

The proposed project area is situated within or in proximity to BLM Class I, II & III Visual Resource Management (VRM) zones. Within each zone, the level of change to the characteristic landscape due to management activities should be as follows: Class I - very low and must not attract attention; Class II - can be visible but does not attract attention; Class III - can attract attention but is not dominant.

In 2000, BLM issued a memorandum that clarified policy for visual resource management (VRM) of Wilderness Study areas. All Wilderness Study Areas should be managed as Class I management objectives until such time as the Congress decides to designate the area as wilderness or release it for other uses.

VRM Class I zones within the project area exist within the Slinkard and Carson-Iceberg Wilderness Study Areas. Notable developments in proximity to these zones include Highway 89 near Monitor Pass, the Bagley Valley main access road and Vaquero Camp at the north end of Silver King Valley. VRM Class II zones within the project area include the viewscape around Indian Creek Reservoir, Indian Creek Campground, Curtz and Summit Lakes and the south end of Bagley Valley. Major developments within or in proximity to the Class II areas include paved and unpaved roads, a reservoir with earthen dam and a campground. The balance of the project area is VRM Class III. Some of the treatment units are within the viewing foreground of travelers on Airport Road and Highway 89, a state designated scenic highway.

ENVIRONMENTAL CONSEQUENCES

Proposed Action

Changes to the landscape by management activities related to vegetation treatments are typically temporary in nature. Most vegetative treatments result in short term visual impacts, both positive and negative, that moderate within a couple of years of treatment. Some vegetative treatments can result in long term visual impacts (+, -) that may take years to moderate if appropriate mitigation is not incorporated into the prescription.

The most significant changes to the existing viewscape would be related to the isolated blackish-gray discoloration that would result from the burning and the contrast between the mechanically treated areas and the adjacent untreated areas. Impacts to scenic quality as viewed from Highway 89 and from Airport Road would temporarily result from slash piles, vehicle tracks, and other visible effects associated with the proposed treatments. These temporary visual changes could be noticeable but would not dominate the view by casual observers. Disruptions to the existing viewscape would be minimal due to the relative small size of the individual treatment areas. Over a period of several years, the disruptions to the existing viewscape would diminish, or lessen with time. Over the course of time the treated areas can possess higher visual appeal than the previously untreated area. The reduced timber stocking would present a more open, park like appearance that would approximate Jeffrey pine stands under a more natural or primeval condition.

The proposed activity would meet the criterion of Class I, II and III zones without undue impairment.

No Action Alternative

Under the No Action Alternative, no disturbance would occur due to the proposed treatments. The short-term impacts in the vicinity VRM zones as described for the Proposed Action would not occur. Conversely, none of the long-term benefits of reduced risk of wildfire would be realized.

WATER QUALITY (Surface)

AFFECTED ENVIRONMENT

The State of California is responsible for managing water quality under the federal Clean Water Act, and has created regional boards to accomplish water quality goals in the state. The project units fall within lands administered by the Lahontan Regional Water Quality Control Board (LRWQCB).

The LRWQCB (1) designates beneficial uses for individual water bodies, (2) establishes water quality objectives to achieve those uses, and (3) conducts assessments to determine whether the objectives are being met. Water quality objectives are written as narratives and numeric criteria, and they address physical, chemical, and biological parameters. Water quality objectives can pertain to all surface waters, individual water bodies, or specific designated uses (LRWQCB, 2005).

The LRWQCB (2005) has established water quality objectives for various wetlands and “minor surface waters,” which include Curtz and Summit lakes. In addition, specific beneficial uses and associated water quality objectives have been established for the East Fork Carson River, Indian Creek Reservoir, Millberry Creek, and Stevens Lake. The following table shows project unit acreages within each drainage area for water bodies having specific objectives and the potential to be affected by the proposed treatments.

Table 8. Project Unit Acres By Drainage Area

Unit \ Drainage Area	East Fork Carson River	Mill-berry Creek	Indian Creek Resvr	Stevens Lake	Curtz Lake	Summit Lake	Total Acres
Airport Road Bend		3					3
Airport Road Central			17				17
Airport Road North			7				7
Airport Road South	15		19				34
Bagley 1	73						73
Bagley 2	153						153
Campground East			13	12			25
Campground Road			5				5
Campground South			11				11
Campground West				16			16
Carson River Trail	52						52
Curtz Lake	3				12		15
Highway 89 West		8					8
Indian Creek 4		8					8
Millberry		24					24
Millberry 2 North/South		42					42
Reservoir			11				11
Summit Lake	9					2	11
Summit Ridge	3						3
Vegetative Trail					14		14
Total Acres	308	85	83	28	26	2	532

When a water body does not meet water quality standards, the LRWQCB may establish a Total Maximum Daily Load (TMDL) for the pollutant[1]. A TMDL for total phosphorus was established for Indian Creek Reservoir because the reservoir became eutrophic in the 1970s (LRWQCB, 2002a). Only nonpoint sources of total phosphorous have been identified, and internal sources from bed sediments make up about 76 percent of the current load. External sources, primarily direct surface runoff and tributary inflow along with a small amount of precipitation, comprise the remaining 24 percent. Public lands in the watershed could contribute external sources of total phosphorous, mainly through sedimentation to the reservoir. Animal and human waste products are also potential sources (Unsicker and Schembri, 2001).

[1] By definition, the TMDL of a pollutant is the sum of all point and nonpoint sources of the pollutant plus a margin of safety that could be allowed while still allowing the standard to be attained. Detailed information on the total phosphorous TMDL for Indian Creek Reservoir can be found at <http://www.waterboards.ca.gov/lahontan/TMDL/Indian_Ck_Res/Indian_Ck_Res_Index.htm>.

ENVIRONMENTAL CONSEQUENCES

Proposed Action

The proposed projects would provide two key benefits to water quality in the long term. First, by thinning tree and brush species, herbaceous ground cover would be enhanced, which would increase infiltration, decrease surface runoff and erosion, and reduce sedimentation to water bodies. Second, the vegetation treatments would reduce the risk of catastrophic wildfire that could expose soils to severe erosion and lead to massive loading of sediment and ash to water bodies.
Short-term adverse impacts to water quality are possible due to surface disturbance associated with project treatments. Removing vegetation would expose soils to erosion, and sediment could be transported to water bodies during runoff events. Overland travel by vehicles and equipment could also loosen soil, making it more susceptible to erosion. These would be short duration effects, however, as ground cover plants would grow rapidly.

The potential for water quality impacts would also be minimized by certain project design features and by implementing best management practices (BMPs). Design features would include: (1) scattering slash and chips, (2) leaving woody debris and standing vegetation in drainages, (3) stipulating that no new roads would be constructed, (4) using existing or natural landings as much as possible, and (5) restoring surface disturbances where they occur. These design features would protect water quality by minimizing surface disturbance, reducing erosion, and capturing sediment before it is transported to water bodies.

BMPs are outlined in Appendix I. They would ensure that (1) projects are implemented when site conditions are appropriate (e.g., soils are dry and least susceptible to compaction and rutting), (2) travel routes and treatment methods that minimize surface disturbance would be chosen, and (3) sensitive areas, such as wetlands and drainages would be avoided.

No Action Alternative

Under the No Action Alternative, no surface disturbance would occur due to the proposed treatments. The short-term adverse impacts to water quality as described for the Proposed Action would not occur. Conversely, none of the long-term benefits to water quality due to enhanced ground cover and reduced risk of wildfire would be realized.

CUMULATIVE IMPACTS

The cumulative impacts of the Proposed Action are based on the direct and indirect effects of the project when considered in combination with the effects of past, present, and planned future actions on BLM land in Alpine County and in the Carson River watershed in Alpine County. Past actions and their effects include all actions that have occurred from the time of European settlement in the late 1800s. Past, present, and planned future activities considered in the following analysis include:

- Fire suppression (since 1940s)
- Grazing (since 1880s)
- Historic timber harvest (since 1880s)
- Forest/fuels treatments (since 1980s)
- Urban/recreational development (since 1880s)

Approximately 1000 acres of the Carson River watershed has been treated (BLM and the USFS) to improve forest health and reduce fuels in the past decade. Present actions include those projects with currently approved environmental analysis. Currently approved environmental analysis exists for less than 100 acres of vegetation treatment per year (BLM & USFS). Reasonably foreseeable future actions include those projects that are in the planning stage and likely to be completed in the next 10 years. Reasonably foreseeable future actions include 100-200 acres of vegetation treatment per year (BLM & USFS).

All resource values and issues affected by the proposed Alpine Forest Restoration Project have been evaluated for cumulative impacts. Examination of the affected environment and environmental consequences section of this environmental assessment reveals that the proposed action would not affect ACEC, environmental justice, floodplains, hazardous wastes, native American religious concerns, prime or unique farm lands, socioeconomic, soils, threatened or endangered plants, wetlands/riparian zones, wild and scenic rivers, or wilderness and thus can not contribute to cumulative impacts on these issues and resources. These issues and resources would not be considered further.

Further examination of the affected environment and environmental consequences section of this environmental assessment reveals that the proposed action may affect air quality, cultural resources, federally listed animal species, fire management, forest health, general wildlife, invasive, nonnative species, recreation, special status species, vegetation, visual resources and water quality and therefore may contribute to cumulative impacts on these issues and resources. Thus these issues and resources would be considered in the following cumulative impacts analysis.

The Alpine Forest Restoration Project would affect a relatively small area, 3 % of the BLM land in Alpine County and 0.2 % of the Carson River watershed in Alpine County. This project would thin 409 acres of Jeffrey pine which represents 19 % of Jeffrey pine acres on BLM land in Alpine County and 2 % of the Jeffrey pine acres in the Carson River watershed in Alpine County. This project would treat 103 acres of pinyon pine which represents 4 % of the pinyon pine acres on BLM land in Alpine County and 1 % of pinyon pine acres in the Carson River watershed in Alpine County. This project will treat 19 acres of white fir which represents 5 % of the white fir acres on BLM land in Alpine County and 0.2 % of the white fir acres in the Carson River watershed in Alpine County. (LCMMP, Vegetation Data. California Department of Forestry and Fire Protection and USFS. 2005)

AIR QUALITY

Past actions including fire suppression have generally led to uncharacteristically dense vegetation and fire exclusion which has resulted in a forest structure that currently supports large intense wildfires that generate smoke emissions that are significantly greater than what could be expected under the historic fire regime. Air quality may be adversely affected locally and short term by the Proposed Action that would introduce ozone, particulates and other pollutants into the atmosphere but the effects on air quality are expected to be minor and would be minimized by conformity to established Great Basin Unified Air Pollution Control District protocols. The Proposed Action would not negatively contribute to the cumulative impacts of local or regional air quality and would result in long-term benefits to air quality because of decreased smoke emissions generated during uncontrolled wildfire events.

CULTURAL RESOURCES

Class III cultural resource surveys have been conducted for specified treatment locations. Historic properties identified during the surveys will be avoided during the treatment; therefore there will be no cumulative impacts to previously identified historic properties.

FEDERALLY LISTED ANIMAL SPECIES/GENERAL WILDLIFE/SPECIAL STATUS SPECIES

There have been treatments done for many years in the general project area and on some of the units proposed for treatment in this document. Some treatments were done for commercial timber many years ago, some treatments were done for fuels reduction in the recent past. The effects of these past treatments on general wildlife, game species and special status species would be very similar to effects discussed for the current proposal. Past treatments were small in scale when compared to the residual landscape habitat available for wildlife. No different effect to overall general wildlife or game populations would be expected from past or present treatments. No federally listed species would be upgraded as a result of the combined effects of past and present treatments. No BLM sensitive species would be upgraded to federal listing and effects to migratory birds would not be important to watershed, Regional or Continental populations as a result of the cumulative effects of past, present foreseeable actions.

FIRE MANAGEMENT

Past actions including fire exclusion and timber harvest have moved conditions away from the historic more resilient fire regime as discussed earlier. The removal of large fire resistant trees dramatically changed forest structure from more open fire resilient forests to those dominated by smaller, less fire resistant trees. This trend, as it relates to wildfire behavior has led to forests throughout the Carson River watershed changing from a frequent, low severity fire regime to an atypical less frequent, moderate to high severity fire regime. Recent fuels treatment projects, although small in scale, have helped reduce small trees and brush, reintroduce the natural role of fire, and break up the connectivity of fuels across the landscape.

Approximately 1000 acres of the Carson River watershed has been treated to reduce fuels in the past decade. This project will treat up to an additional 532 acres of the watershed in an area where many unplanned ignitions occur. This will cumulatively reduce high intensity fuels conditions. This is a beneficial cumulative effect because high intensity fuels conditions can cause undesirable property and resource damage in a wildfire event.

FOREST HEALTH/VEGETATION

Past actions such as fire suppression and timber harvest have resulted in a watershed that has moved away from the historic range of variability in terms of stand densities, species composition and forest structure. General trends in forest vegetation across the landscape as a result of past actions include: denser stands, stands with insect and disease outbreaks, species composition shifts to more fire intolerant species, forest structure that is more dominated by small trees rather than medium/large trees, increased accumulation of ground fuels and denser ground vegetation. The present vegetation management projects and reasonably foreseeable future vegetation management projects in the Carson River watershed have or would be designed to create forest conditions that are more resistant to adverse effects of uncharacteristic wildfire, drought, insects, and disease. There would be beneficial cumulative effects associated with the Proposed Action. No negative cumulative effects from the Proposed Action are expected.

INVASIVE, NONNATIVE SPECIES

Invasive, nonnative species currently exist in the general vicinity of the project area. Although, the proposed project may create disturbed areas susceptible to invasion by noxious and invasive species monitoring and inclusion of any invaded sites in the field office annual weed treatment plan would prevent establishment and spread of these species in the treated areas. Therefore, the proposed action

does not have the capability to contribute to cumulative impacts resulting from establishment and spread of these species in the vicinity of the proposed project.

RECREATION

In the past 20 years users have been subjected to disturbances from vegetation management activities several times as past projects were completed. These activities may have caused temporary displacement of users but the effects have been short in duration. The vast majority of federal lands in the area would be undisturbed by the fuel treatments and recreation opportunities on these federal lands are expected to be preserved. The treated areas are expected to recover quickly and provide recreation opportunities similar to what they now provide. No adverse cumulative impacts to recreation opportunities in the vicinity are expected in the foreseeable future.

VISUAL RESOURCES

In the past 20 years users have been subjected to disturbances from vegetation management activities several times as past projects were completed. These activities may have caused visual changes but the effects have been short in duration. It is expected that with untreated patches and timely treatment of fuels as part of most unit proposals there will be no cumulative effect scenic resources in the project area because ground disturbance will be minimized and thinning residues will be promptly removed. Visual changes from activities such as prescribed fire will affect some users as they have in the past but these changes are part of the ecology of a forest and expected to be of a short duration. Over the long term visual quality will be enhanced by the more naturally open mosaic of trees and understory vegetation and more visible large trees. Cumulative impacts to visual resources would be positive in the long term as healthy vegetation returns and management activities become muted over time.

WATER QUALITY

Along with other management actions, the proposed vegetation treatments would provide cumulative benefits to water quality. Past actions include decisions by the BLM (2007) to close thousands of acres in Alpine County to motorized vehicle travel and to limit thousands of additional acres to designated roads and trails, and to close all or part of three allotments to livestock grazing. In addition, the South Tahoe Public Utility District has proposed an oxygenation project in Indian Creek Reservoir to address the internal phosphorous load associated with bed sediments.

It has been determined that cumulative impacts would be negligible as a result of implementation of the Proposed Action.

MONITORING

The monitoring described in the Proposed Action is sufficient for this action.

IV. PERSONS, GROUPS, AND AGENCIES CONSULTED

LIST OF PREPARERS

Bureau of Land Management

NAME	TITLE	PROJECT EXPERTISE
John Axtell	Wildlife Biologist	Wildlife
Keith Barker	Fire Ecologist	Project Lead
Arthur Callan	Outdoor Recreation Planner	Recreation, Wilderness, VRM
James DeLaureal	Soil Scientist	Invasive Species, Soils
Terri Knutson	NEPA Coordinator	NEPA Coordinator
Susan McCabe	Archaeologist	Archaeologist
Tim Roide	Fuels Specialist	Air Quality, Proposed Action
Jim Schroeder	Hydrologist	Water Quality, Riparian Zones
Rita Suminski	Supervisory Wildlife Biologist	Wildlife, Migratory Birds, T/E
Dean Tonenna	Plant Biologist	Special Status Plant Species
Steep Weiss	Forester	Forest Health, Vegetation

PERSONS, GROUPS, OR AGENCIES CONSULTED

NAME	AGENCY	PROJECT EXPERTISE
	Alpine County Board of Supervisors	Public Representation
Mr. Jeff Brees	Alpine County Fire Safe Council	Public Safety
	Alpine County Public Works	Public Safety
Mr. Kent Smith	California Dept of Fish and Game Sacramento Valley-Central Sierra Region	Wildlife
	Cal Fire Amador-El Dorado Unit	Public Safety
Ms. Andrea Stanley	California Regional Water Quality Control Board Lahontan Region	Water Quality
	Humbolt-Toiyabe National Forest Carson Ranger District	Federal Land Manager
Ms. Debbi Waldear	Friends of Hope Valley	Public Interest
Mr. Jonathan Becknell	Great Basin Unified Air Pollution Control District	Air Quality
Ms. Linda Hill		Private Home Owner
Mr. William Richmond		Private Home Owner
	Washoe Tribe of Nevada and California	Cultural Resources

REFERENCES

Alpine County Community Fire Plan, May 2007.

Alpine County Forest Lands Advisory Committee. 1992. Forests in Crisis: Eastern Alpine County. 26 pp.

Axtell, J. 2008. Specialist report for Alpine Fuels Treatment Project EA. Unpub. Doc. CCFO.

Barker, K. 2008. Specialist report concerning acres treated and acres retained for Alpine Fuels Treatment Project using fine and coarse filter levels. Unpub. Doc. CCFO.

Beidleman, C. (ed) 2000. Partners in Flight Land Bird Conservation Project, Version 1.0 Colorado Partners in Flight, Estes Park, Colorado.

Bernand M. Personal communication between Mandy Bernand, Carson Ranger District Forester and Rita Suminski, CCFO Supervisory Wildlife Biologist.

Bioscience. 1991. Diversity and dwarf mistletoe. Vol. 41, p 755.

BLM. 2003. Nevada BLM Sensitive Species List. Unpub. Doc. Signed 7-1-03. Reno, NV.

----------.2006. Various California Dept. Game and Fish reports filed with Carson City Field Office concerning fisheries. Unpub. Carson City, NV.

----------. 2007. IM-2008-050 Migratory Bird Treaty Act – Interim Guidance. Dated December 18, 2007. Unpub. Doc. CCFO files.

Block, W. and D. Finch, ed. 1997. Ecology of Southwestern Ponderosa Pine Forests IN Songbird ecology in southwestern ponderosa pine forests: a literature review. USDA, FS, Rocky Mtn. Forest and Range Exp. Sta. Gen. Tech. Rep. RM-GTR-292. Ft. Collins, CO.

Brost, B. 2006. Personal communication between Brian Brost, Fisher Inventory Lead – Sequoia National Forest and Rita Suminski, CCFO Supervisory Wildlife Biologist.

Brown, J. and J. Smith. 2000. Wildland fire in ecosystems, effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2.

Bureau of Land Management Nevada State Office. Vegetation Treatments on Bureau of Land Management Lands in 17 Western States, Programmatic Environmental Report. June 2007.

Bureau of Land Management. 2007. Alpine County Resource Management Plan Amendment. BLM/CC/GI-06/021+1610.

California Department of Forestry. 2003. Fire and Resource Assessment Program. Fire Regime Condition Class.

California Department of Forestry. 2005. California Land Cover Mapping and Monitoring Program, Vegetation Data.

Carson City Field Office Consolidated Resource Management Plan, 2001.

Carson City Field Office Fire Management Plan, 2004.

Collins BM, Moghaddas JJ, Stephens SL (2007) Initial changes in forest structure and understory plant communities following fuel reduction activities in a Sierra Nevada mixed conifer forest. Forest Ecology and Management 239, 102-111.

Easton, M. 2007. Personal communication between Maureen Easton, Wildlife Biologist Carson Ranger District and Rita Suminski, CCFO Supervisory Wildlife Biolgost.

Faaborg, J. et al. 1992. Habitat Fragmentation in the temperate zone: a perspective for managers IN Status and Management of Neotropical Migratory Birds. Gen. Tech. Rep. RM-229. Ft. Collins, CO.

Floyd et al. 2007. Atlas of the breeding birds of Nevada. Univ of Nev Press. Reno. 581 pp.

Frank, Dennis and Sturtevant, Bob. 2004. Forest Restoration Guidelines in Ponderosa Pine on the Front Range of Colorado. Colorado State Forest Service 2004 Forest Health Report and The Forest Restoration Institute at Northern Arizona University. 8 pp.

Guyon, J. 2008. Specialist comment concerning Heterobasidion annosus for Alpine Fuels Treatment Project. Unpub. Doc. CCFO.

Halbrook, J., Han, H., Graham, R., Jain, T., Denner, R. Mastication: A fuel reduction and site preparation alternative. Proceedings of the 29th Council on Forest Engineering Conference; August 2006.

Hatchet B., Hogan, P. and Grismer M. Mechanical Mastication Thins Lake Tahoe Forest with Few Adverse Impacts. California Agriculture. April-June 2006.

Hawkworth, F., and D. Weins. 1996. Dwarf mistltoes: biology, pathology, and systematics. USDA FS, Agric. Handbk. 79.

Human Health and Ecological Risk Assessment for Borax (Sporax®) Final Report. 2006. USDA Forest Service. 136pp.

Kane, J., Varner, M., and Knapp, E. Initial Understory Vegetation Response to Mechanical Mastication Fuel Treatments: Balancing Biodiversity and Fire Hazard Reduction. Proceedings of the Third International Fire Ecology and Management Congress. November 2006.

Kane, J., Knapp, E., and Varner M. Variability in loading of mechanically masticated fuel beds in northern California and southwestern Oregon. Fuel Management – How to Measure Success: Conference Proceedings. March 2006.

Kreye, J., Varner, M. Moisture dynamics in masticated fuelbeds: A preliminary analysis. The fire environment--innovations, management, and policy; conference proceedings. March 2007.

Lahontan Regional Water Quality Control Board. 2002a. Adopted amendments to the Water

Quality Control Plan for the Lahontan Region concerning total maximum daily load and implementation plan for Indian Creek Reservoir, Alpine County, California. 11 pp. <http://www.waterboards.ca.gov/lahontan/TMDL/Indian_Ck_Res/icradopted_1.pdf>

Lahontan Regional Water Quality Control Board. 2005. Water quality control plan for the Lahontan region, north and south basins, with amendments. <http://www.waterboards.ca.gov/lahontan/BPlan/bplanchapters.html>

Lowe, Kimberly. 2005. Working Papers in Southwestern Ponderosa Pine Forest Restoration Number 10: The Stand Treatment Impacts on Forest Health (STIFH) Model. 8 pp.

Marcot B. et al 1994. Managing for featured, threatened, endangered and sensitive species and unique habitats for ecosystem sustainability. Gen. Tech. Rept. PNW-GTR-329. Corvallis, OR.

Maxwell, Wayne and Franklin Ward. 1979. Photo Series for Quantifying Forest Residues in the: Sierra Mixed Conifer Type and Sierra True Fir Type. USDA Forest Service General Technical Report PNW-95.

McIvor M. 2005. Important Bird Areas of Nevada. Lahontan Audubon Society. Reno, NV.

Mellison, C. 2008. Personal communication between Chad Mellison, fire liason for U.S. Fish and Wildlife Service – Reno office and Rita Suminski, CCFO Supervisory Wildlife Biologist.

Northern Prairie Wildlife Research Center. 2007. Forest and rangeland birds of the United States: Natural History and Habitat use, Forest and Rangeland Management. U.S. Geologic Survey. www.npwrc.usgs.gov/resource/birds/forest/fore.htm.

Oliver, William W. 1972. Growth after thinning ponderosa and Jeffery pine pole stands in northeastern California. Res. Pap. PSW-85. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station. 8 pp.

Peek, J. and P. Krausman. 1995. Grazing and mule deer in P.R. Krausman, ed. Rangeland Wildlife. The Society for Range Management, Denver. pp. 192.

Raish C. et al. 1997. Contemporary Human Use of Southwest Pondersoa Pine Forests IN Songbird ecology in southwestern ponderosa pine forests: a literature review. USDA, FS, Rocky Mtn. Forest and Range Exp. Sta. Gen. Tech. Rep. RM-GTR-292. Ft. Collins, CO.

Restoring Fire-Adapted Ecosystems on Federal Land, A Cohesive Strategy For Protecting People and Sustaining Natural Resources. February 2002.

Reynolds R. et al. 1992. Management recommendations for the northern goshawk in the southwestern United States. Gen. Tech. Rep. RM-217 Ft. Collins, CO.

Strayer, D., M. Power, W. Fagan, S. Pickett and J. Belnap. 2003. BioScience. August. Vol. 53 No. 8.

Szaro, R. et al. 1999. Ecological Stewardship: A common reference for ecosystem management. Vol. II. USFS/ BLM/ USFWS/ NPS/USGS/NOAA. Elsevier Science, Ltd. UK. p 229.

Taylor, Alan H. 2004. Identifying Forest Reference Conditions on Early Cut-Over Lands, Lake Tahoe Basin, USA. The Ecological Society of America: Ecological Applications, 14(6), 2004, pp. 1903-1920.

Tidwell, P. 2007. Personal communication between Paul Tidwell, Forest Silviculturist, Superior National Forest and Rita Suminski, CCFO Supervisory Wildlife Biologist.

The National Fire Plan, Review and Update of the 1995 Federal Wildland Fire Management Policy. January 2001.

Tonenna, D. 2008. Specialist report for Alpine Fuels Treatment Project EA. Unpub. Doc. CCFO.

Unsicker, J. and H. Schembri. 2001. Total maximum daily load for Indian Creek Reservoir, Alpine County, California. Technical Support Document. Lahontan Regional Water Quality Control Board. 62 pp. http://www.waterboards.ca.gov/lahontan/TMDL/Indian_Ck_Res/icrtechproofed2.pdf

USDA Forest Service Forest Health Protection, 2006. Human and Environmental Health Risks Associated with the Use of Borax.

USFS. ND. Alder Creek Project Environmental Assessment. Appendix B. Truckee Ranger District. Truckee, CA. page B-1 through B-11.

USFWS. 1995. Lahontan cutthroat trout Recovery Plan. Region 1, Portland, OR. pp. 11-12.

----------. 2003. Endangered and Threatened Wildlife and Plants; 12- Month finding for a Petition To List the Sierra Nevada District Population Segment of the Mountain Yellow-legged Frog (Rana muscosa). Federal Register 68:2283-2303.

---------- 2004. Revised Recovery Plan for the Paiute cutthroat trout (*Oncorhynchus clarki seleniris*). Portland, Oregon. ix + 105 pp.

----------. 2006. April, 2006 Masterlist of federally listed threatened, endangered, proposed for listing and candidate species that occur, or have potential habitat within the Alpine County Plan Amendment area.

Wallmo, O. et al. 1981. Mule and black-tailed deer of North America. A Wildlife Mgt. Inst. Book. Olof Wallmo, Ed. Univ of Nebraska, Lincoln. Pp. 273-284.

Weiss S. 2008. Personal communication between Steep Weiss, CCFO forester and Rita Suminski, CCFO Supervisory Wildlife Biologist.

Wildland Fire Communicator's Guide. National Interagency Fire Center.

Wildlife Action Plan Team. 2006. Nevada Wildlife Action Plan. Nevada Department of Wildlife, Reno.

Wildlife Action Plan Team. 2007. California Wildlife Action Plan. California Department of Game and Fish, Sacramento.

frap.cdf.ca.gov/data/frapgisdata/select.asp

www.natureserve.com

www.dfg.ca.gov

www.blm.gov/ca/pdfs/pa_pdfs/biology_pdfs/SensitiveAnimals.pdf

www.blm.gov/ca/pdfs/pa_pdfs/biology_pdfs/SensitivePlants.pdf

www.nnhp.org

V. APPENDICES AND MAPS

APPENDIX A – Federally listed species and habitats

The following is a description of the habitat that is important for federally listed species that occur or have potential to occur in or near the project area:

Lahontan Cutthroat Trout
Lahontan cutthroat trout are located in several aquatic habitats that either flow across some BLM lands or are found entirely on BLM lands. East Fork Carson River, Indian Creek Reservoir and Indian creek that drain into this body of water contain Lahontan Cutthroat Trout. There are LCT in Bagley Valley (USFWS 1995, BLM 2007).

Fisher
Fishers are habitat specialists that use late successional habitat with low growing-high canopy closure (50%+), large trees and snags, large woody debris, large hardwoods, multiple canopy layers, and avoidance of areas lacking overhead canopy cover. Fishers may also occupy and reproduce in some managed forest landscapes that provide some of the habitat elements important to fisher, such as relatively large trees, high canopy closure, large legacy trees, and large woody debris, in second-growth forest stands (www.natureserve.com). Second-growth forest found on BLM lands in Alpine County may contain some habitat potentially used by fisher (Brost 2006). Scattered sightings have been reported (www.nnhp.org). Riparian areas may be important to fishers because they provide important rest site elements, such as broken tops, snags, and coarse woody debris. It is believed any fisher habitat on BLM land would serve primarily as travel corridors between wilderness areas and the Carson River area.

Mountain Yellow-legged Frog
This frog is found in mountainous habitat. Key habitats for Mountain Yellow-legged Frog include riparian/riverine corridors, wetlands, and wetland/upland mosaics often found in association with sub-alpine forests. Sierran frogs are most abundant in high elevation lakes and slow-moving portions of streams. This frog seldom is found away from water, but it may cross upland areas in moving between summer and winter habitats. Wintering sites include areas near shore under ledges and in deep underwater crevices. It also includes any upland habitat regularly used for feeding or wintering (e.g., mesic forest) [USFWS 2003; www.natureserve.com]. This frog occurs in the general Alpine County area (USFWS 2004). Areas with potential habitat do occur on BLM lands in Alpine County.

Yosemite Toad
Key habitat for Yosemite Toad consists of high mountain wet meadows and borders of forests. It obtains shelter in rodent burrows as well as in dense vegetation. It breeds in shallow edges of snow melt pools and ponds or along edges of lakes and slow-moving streams. This toad has the potential to occur at the highest elevation lands administered by the BLM. Management for boreal meadows and meadow/forest borders is conducive to maintenance or re-establishment of Yosemite toad populations (USFWS2003 b; www.natureserve.com). This toad occurs in the general Alpine County area (USFWS 2004). Areas with potential habitat do occur on BLM lands in Alpine County.

*The 2006 Master list of federally listed species provided by the U.S. Fish and Wildlife Service for the Alpine County Plan Amendment was used as the source for species to analyze in this document. However, the bald eagle which was included on the 2006 list was delisted in 2007 and not included in this analysis. Additionally, conversations held in 2008 between USFWS and CCFO personnel determined that Paiute cutthroat trout, which was on the 2006 list, didn't have habitat within lands administered by the BLM and didn't need to be included in this analysis.

APPENDIX B – General Wildlife Habitats

Several diverse general wildlife habitats occur within the project area (Wildlife Action Plan Team 2006; Wildlife Action Plan Team 2007). These are described.

Sagebrush – Within the project area, this habitat type is interspersed in the conifer forests and woodlands. Some areas are large enough to be a dominant habitat type, but many are totally influenced by the surrounding treed areas. Where stands of sage brush occur, mountain big sagebrush dominates higher elevation, moister sites and Wyoming big sagebrush dominates lower elevation, drier sites. Grasses and forbs such as bluegrass, Indian paintbrush and the half-shrub Eriogonum (buckwheat) are common in the understory. Bitterbrush can be co-dominant with mountain big sagebrush. Manzanita and ceanothus can also be abundant in some areas supporting sage brush. Great Basin big sagebrush and low sagebrush can be found as small inclusions associated with specific soil types. Wildlife species such as treefrogs, least chipmunk and horned lark can be found in this habitat type

Montane Meadows – This dry habitat type is found only as an inclusion within the other habitat types and aren't extensive within the project area. These dry meadows don't support a different assemblage of wildlife species than the surrounding area.

Sierra Conifer Forests and Woodlands – This habitat is extremely diverse. Mixed conifer forests and pinyon-juniper woodlands occur in the lower elevation, warm, xeric sites. Common tree species include white fir on north slopes and Jeffrey pine / pinyon pine on other slopes. Large diameter dead trees are especially valuable for wildlife. Understory species include bitterbrush, sagebrush, snowberry and manzanita. Needlegrass and pennyroyal are common herbaceous species. At higher elevations, sub-alpine conifer is common. Mountain mahogany, snowberry and bitterbrush as well as herbaceous species can be found in the understory, but these are much reduced as the forest canopy closes. Most of the conifer forest found on BLM lands is second or third growth dating to the Comstock Era. Small areas of montane meadows are interspersed in this habitat type. Wildlife species associated with second growth include Cooper's hawk, montane shrew and Sierra mountain king snake.

Springs and Springbrooks - The general Alpine County area has numerous springs, some of which are located on BLM administered lands. Bagley Valley has important spring complexes. Vegetation associated with the springs and their outflows can range from conifer trees to cottonwood stands. There can be shrubby understory of rose and willow or, there may be only herbaceous stands of sedges, rushes and forbs. The understory is highly dependent on the exact soil type and microclimate at these elevations. Wildlife species associated with this habitat type include wandering garter snake, shrew sp. and Cooper's hawk.

Sierran Rivers and Streams & Lakes and Reservoirs (Wildlife Action Plan Team 2006) - Riparian and Aquatic Habitats (Wildlife Action Plan Team 2007) are located throughout Alpine County and lands administered by the BLM. The Carson River and streams associated with BLM lands in Alpine County have riparian communities comprised of overstory species such as mountain alder, cottonwood, willow and dogwood. Chokecherry, wild rose and other shrubs and herbaceous species are common in the understory. The East Fork of the Carson River flows through the general project area. It contains brook and brown trout, mountain whitefish, a Tahoe sucker, speckled dace and Lahontan red-shiner (BLM 2006).

Several streams occur in the Project area including Millberry Creek, Markleeville Creek, Indian Creek and Scott Creek**.** Indian Creek probably supports some fish from the Indian Creek Reservoir, especially

young of the species present. The other creeks do not support game fish, but may serve as a nursery area for larger fish associated with the Carson River. The smaller streams may also support native non-game species such as Paiute sculpin and tui chub (BLM 2006). These streams also support amphibians and reptiles that only occur in wetter environments.

Lake and reservoir habitats include Indian Creek Reservoir which maintains water yearlong. Indian Creek Reservoir contains a tui chub, the Tahoe sucker and stocked rainbow trout. Stevens Lake lies adjacent to Indian Creek Reservoir, but has no fish since it a tertiary effluent treatment structure. Curtz Lake is a small pond that often dries in summer. It supports a high quality, late seral ephemeral wet meadow. Summit Lake has water yearlong and is stocked with rainbow trout as a put- and- take fishery. It supports a small wet meadow around the fringe of the Lake. Each of the lakes supports emergent vegetation and ephemeral wet meadow vegetation. Species associated with these habitat types include hummingbird species, warblers, western pond turtle, leopard frog, shrew species, jumping mouse and myotis / bats.

APPENDIX C – Nevada and California BLM Sensitive Species & State of California Status Species

The following is a list of Nevada and California BLM Sensitive Species:

Sierra alligator lizard *Elgaria coerulea palmeri*
Northern leopard frog *Rana pipiens*
Golden Eagle *Aquila chrysaetos*
Greater sage-grouse *Centrocercus urophasianus* – proposed Mono sub-population
California spotted owl *Strix occidentalis occidentalis*
(USFS records were examined to determine if a goshawk territory overlapped into the BLM project areas since FS has the better habitat. No territories overlap into the project areas [Easton 2007).
Northern Goshawk *Accipiter gentilis*
(USFS records were examined to determine if a goshawk territory overlapped into the BLM project areas since FS has the better habitat. No territories overlap into the project areas [Easton 2007).
Short-eared Owl *Asio flammeus*
Long-eared Owl *Asio otus*
Juniper Titmouse *Baeolophus griseus*
Pinyon Jay *Gymnorhinus cyanocephalus*
Lewis's Woodpecker *Melanerpes lewis*
Mountain quail *Oreortyx pictus* - NV
Red-naped Sapsucker *Sphyrapicus nuchalis*
Black Rosy-Finch *Leucosticte atrata*
Pallid bat *Antrozous pallidus*
Spotted bat *Euderma maculatum*
Long-eared myotis *Myotis evotis*
Yuma myotis *Myotis yumanensis*
Silver-haired bat *Lasionycteris noctivagans*
Small-footed myotis *Myotis ciliolabrum*
Long-legged myotis *Myotis volans*
Big brown bat *Eptesicus fuscus*
Hoary bat *Lasiurus cinereus*
Brazilian free-tailed bat *Tadarida braziliensis*
Mono Lake checkerspot butterfly *Euphydryas editha monoensis*
(Great Gray Owl *Strix nebulosa)*
occurs in the general area, but not in proposed treatment units. There isn't opportunity to create habitat for this species.)

The following is a list of species with special status in the State of California that are also Nevada BLM sensitive species *

<u>Birds and Raptors</u>
Cooper's hawk *Accipiter cooperii* - DFG
Sharp-shinned hawk *Accipter striatus* - DFG
Osprey *Pandion haliaetus* - DFG
Merlin *Falco columbarius* - DFG
Vaux's swift *Chatura vauxi* - DFG

DFG Department of Fish and Game fully protected species

* The State of California has listed certain species under the California Endangered Species Act. In 1996, the BLM in California determined it would carry out management for the conservation of project species listed as rare, threatened, or endangered by the State of California. BLM in California generally lists the State of California status species and has recommended these be listed for other Alpine County NEPA documentation.

APPENDIX D- Migratory Bird Species of Concern

The following migratory bird species of concern (BLM 2007) have habitats* within the project areas and / or occur within it:

Western Shrublands **(**Beidleman 2000)

Shrubsteppe (Beidleman 2000), **Sagebrush** (Neel 1999)

Sage grouse	*Centrocercus urophasianus*

Mountain Shrub (Neel 1999; Beidleman 2000)

Virginia's Warbler	*Vermivora virginiae*

Woodland – (Beidleman 2000) Pinyon-juniper woodlands are characteristic of this habitat type. Species of concern associated with this habitat type in the plan area are,

Gray Vireo	*Vireo vicinior*
Pinyon Jay	*Gymnorhinus cyanocephalus*

Coniferous Forest - (Beidleman 2000) This habitat type includes Ponderosa pine, mixed conifer and spruce-fir among others. Several suites of birds can be identified due to the many forest types included in the category.

Open, dry, old Ponderosa pine forests historically maintained by low intensity fire (Beidleman 2000):

Northern Goshawk	*Accipiter gentilis*

Mixed conifer forests (Beidleman 2000):

California spotted owl	*Strix occidentalus occidentalus*
Band-tailed Pigeon	*Patagioenas fasciata*
White-headed woodpecker	*Picoides albolarvatus*

Riparian – Species of concern associated with this habitat type in the project area,

Wetlands and Lakes (Neel 1999) Playas

Snowy Plover	*Charadrius alexandrinus*
American Avocet	*Recurvirostra Americana*
Long-billed Curlew	*Numenius americanus*
Northern Pintail	*Anas acuta*

Lowland Riparian (Neel 1999)

Mallard	*Anas platyrhynchos*

Mountain Riparian (Neel 1999)

Lewis's woodpecker –	*Melanerpes lewis*
Rufous Hummingbird	*Selasphorus rufus*

Deciduous Forest – Aspen (Beidleman 2000)

Red-naped Sapsucker	*Sphyrapicus nuchalis* (aspen critical, cavity nester)
Williamson's sapsucker	*Sphyrapicus thyroideus*

* the habitat associations shown are not the only habitats used or that are important. Habitats are shown to give a general idea of what the each species uses compared to other species.

APPENDIX E – Impacts to federally listed species and habitats

A discussion of the improvements and mitigation to federally listed species and habitats shown in Table 2 is provided.

Lahontan Cutthroat Trout
With treatment, the chance of a catastrophic wildfire is reduced. Catastrophic wildfire wouldn't stay within the boundaries of the treatment units and could burn over occupied LCT habitat. With the proposed treatment, LCT waters could be spared the possible high sediment loading and increased temperatures that accompany catastrophic wildfire. Reducing catastrophic fire risk could prevent the Carson Drainage population from being upgraded in federal listing while allowing for its recovery.

Treatment proposed at Bagley 1 and 2 are designed, in part, to maintain spring brooks, riparian areas and water flows at spring complexes used by sage grouse. This treatment would also maintain the current surface and subsurface water flow from the spring complex into the upper Carson River.

Impacts to LCT from treatment done adjacent to Indian Creek Reservoir could be seen in the form of sediment loading. The general practices to control soil erosion as well as the post-treatment monitoring planned into the proposal would make this impact negligible. The treatment prescriptions that include spreading treated material would help bind soils. Additionally, observation of past treatment in this area has shown that soil movement is minimal.

Fisher
In March of 2008, Rita Suminski spoke with Chad Mellison of the U.S. Fish and Wildlife Service about fisher occurrence in Alpine County (Mellison 2008). At that time, Mr. Mellison stated that fisher didn't need to be considered to occur on BLM land. However, old sightings of fisher in Alpine County existed in Nevada Natural Heritage records. A compromise between these two sources was made. Fisher requires high canopy closure conifers with late successional characteristics. It is also known to use some managed forests. Fisher cannot tolerate human disturbance (www.natureserve.com).

Although fishers wouldn't be expected to use BLM lands or the treatment units much, there is a possibility these animals would use a creek as a travel corridor to move between wilderness areas to the west, to the Carson River system to the east and wilderness areas to the south. Any potential fisher habitat on BLM land occurs in the WSA's, and along the east side of the Carson River. There is probably habitat in the wilderness areas managed by Forest Service that surround Alpine County. The decision was made to try to create a travel corridor for potential fisher use to link these areas. The only site with potential for this Millberry 2 with the Millberry drainage being the corridor. This area currently doesn't support either the closed canopy of late successional characteristics needed – but it could with treatment designed to reduce tree basal area over a number of entry times. Millberry 2 is a north slope site with a high site index. When a site index is 70+, there is an opportunity to recruit large diameter trees with high canopy closure (Tidwell 2007). The proposed treatment was designed to begin the process to maintain and improve this area for potential fisher travel. This type of treatment would leave some trees to grow very large with a closed canopy.

If a fisher travel corridor exists or can be created, reducing the chance of fire would allow this to remain intact.

Mountain Yellow-legged Frog

With treatment, the chance of a catastrophic wildfire is reduced. Wet habitats supporting this frog could be significantly altered and / or destroyed. Reducing catastrophic fire risk could assist in maintaining this species as a candidate while allowing for it recovery.

Treatment units adjacent to Curtz Lake could alter or eliminate habitat used by this frog. A buffer area has been established to maintain standing dead and down logs as habitat sites for this frog. Treatment proposed at Bagley 1 and 2 are designed, in part, to maintain spring brooks, riparian areas and water flows at spring complexes used by sage grouse. This treatment would also enhance and protect meadow habitat needed by this frog.

Yosemite Toad

With treatment, the chance of a catastrophic wildfire is reduced. Wet habitats supporting this toad could be significantly altered and / or destroyed. Reducing catastrophic fire risk could assist in maintaining this species as a candidate while allowing for its recovery.

Although this toad isn't expected to use Curtz Lake, the buffer area would retain habitat used by this toad if it did occur. Treatment proposed at Bagley 1 and 2 are designed, in part, to maintain spring brooks, riparian areas and water flows at spring complexes used by sage grouse. This treatment would also enhance and protect meadow habitat needed by this toad. Dropped trees left on-site would provide habitat for this species

No impacts to the four federally listed species are expected from actual implementation. Work would not be done in Indian Creek Reservoir with LCT, nor would it be done in or around Curtz or Summit Lakes with potential for leopard frog and Yosemite toad. Work on the Bagley units would be done in fall or winter when the amphibians would be in winter burrows. The proposed borax treatments have very specific application stipulations to prevent movement. Research has shown that at treatment levels, borax entering open water won't affect LCT. It also indicates that at the levels proposed, there won't be an effect from direct ingestion or contact, or from indirect use of vegetation (USFS ND).

APPENDIX F – Effects to Nevada and California BLM Sensitive Species

Narratives describing the specific mitigation, improvements, blanks and adverse affects shown in Table 5.

The species that were left nearly blank, showing a benefit in one or two units are generally associated with mature or old-growth tree stands that don't occur in the proposed treatment units. In some cases, treatment would enhance a habitat component such as aspen retention or mature tree recruitment that might cause the species to begin using the area or remain.

Sierra lizard would benefit from the openings and downed logs. Northern leopard frog would benefit from the preservation of the riparian system in Bagley Valley (www.natureserve.com).

Cooper's hawk would benefit from the creation of small openings and the edge effect between the treated areas and the untreated surrounding area (www.natureserve.com). The benefit of the two Bagley treatments for sage grouse has been discussed. Benefits to mountain quail have been discussed. Snags are being retained in nearly every unit as a standard practice which is beneficial to Lewis's woodpecker, Vaux swift, long-eared myotis, long-legged myotis and hoary bat (www.natureserve.com). Big brown bat benefits from snags being left in a unit where aspen would be retained (www.natureserve.com). The standard practice to leave exfoliating bark trees would mitigate most negative effects to long-eared myotis which uses these strata for roosting. The proposed plantings would be beneficial to sharp-shinned hawk as this species uses young conifer stands (www.natureserve.com). Mono Lake Checkerspot would benefit from the small openings that would be created and from the freshening and retention of shrubs and forbs that provide its food sources (www.natureserve.com).

Long-earred owl is a mistletoe broom nester (www.natureserve.com). Mistletoe infested trees support a disproportionate abundance of migratory birds; abundance is directly proportional to infestation level (Bioscience 1991). Mistletoe treatment could be an impact. However, mistletoe brooms are found throughout the untreated area so sufficient nesting strata would remain (Weiss 2008). Local populations would be minimally affected. (Local is defined as the eastern slope of the Sierra Nevada range.) Continental populations are stable (www.natureserve.com) and there would be no effect to these. Thinning treatments impact juniper titmouse (Block and Finch 1997). However, only 0.2% of the Carson River Watershed would be treated; over 99% of this species' habitat would remain untreated in the Watershed alone. Population levels for this bird are not a concern (www.natureserve.com).

Gray vireo and pinyon jay are pinyon woodland associated species. Some individuals of some species would lose pinyon habitat. However, the treatment would affect only 1% of the pinyon available in the Carson River Watershed alone (Barker 2008). Continental populations of gray vireo are stable (Floyd 2007); loss of this habitat won't have an affect on individuals or the population at large. Continental populations of pinyon jays is down, attributed to loss of mature pinyon and other non-forest activities (Floyd 2007; BISON ND). The pinyon trees being removed are not mature pinyon so is not ideal habitat for pinyon jay at this point. On a landscape scale, there is sufficient pinyon habitat left in Alpine County and western Nevada to provide mature trees and mature tree recruitment. The proposed treatments on 1% of the pinyon within the Carson Watershed isn't a significant enough impact to cause further decline in the Continental pinyon jay population. Lewis woodpecker, long-eared myotis and Vaux swift use snags (BISON ND) that are being removed in one unit. Osprey, merlin, Yuma myotis, big brown and hoary bats use snags near lakes, which are being removed from the same unit. In this case, specific public safety issues outweigh the resource issue. Additionally, the loss of the snags would only displace local individuals. On a regional and Continental scale, populations of long-eared myotis, big brown bat, hoary bat, Lewis's woodpecker and Vaux swift are of "least concern" (www.natureserve.com). Yuma myotis

populations are secured and large (www.natureserve.com). The only serious threats to osprey and merlin populations are organopesticides (www.natureserve.com).

Research has shown that at treatment levels, borax entering open water won't affect aquatic species. It also indicates that at the levels proposed, there won't be an effect from terrestrial species direct ingestion or contact, or from indirect use of vegetation or invertebrates (USFS ND).

Impacts associated with the treatment process are different than impacts associated with residual habitat. Implementation impacts are short-term but may affect individuals of species whose habitat would be benefited in the long-term. All of the species listed may occur within the treatment units at various times of the year to perform various activities. Spring burning, mastication or hand cutting could disturb individuals of the species listed. Mitigation for treatment of the Bagley units has been written which would confine treatment times to late summer, fall or winter since the treatments are being done specifically to benefit grouse. Mitigation for the other species has been written to try to perform treatments from mid-summer through winter. However, because fuels reduction is the main goal of the treatment, the current year threat of catastrophic wildfire must be weighted against the loss of annual production for a minimal number of species. If treatment had to be done during the spring season, only some of that year's production would be lost and that wouldn't be important to the local populations nor would it cause changes in regional or Continental population trends.

APPENDIX G – Effects to Migratory Birds

There are groups of the migratory bird species of concern that would specifically benefit directly or indirectly from the proposed treatment. The specific benefit and bird species are shown,

Preventing catastrophic stand replacing wildfire

Band-tailed Pigeon	California Spotted Owl
White-headed Woodpecker	Pinyon Jay
Northern Goshawk	

Re-introducing natural fire

Red-naped Sapsucker	Lewis's Woodpecker
Northern Goshawk	White-headed Woodpecker
Olive-sided Flycatcher	

Retaining or recruiting of aspen

Red-naped Sapsucker

Recruiting un-even aged timber stands

California spotted owl	Lewis's woodpecker
Band-tailed Pigeon	Rufous Hummingbird
White-headed woodpecker	Pinyon Jay

BISON ND, Finch 1993, Floyd 2007, Neel 1999, NDOW 2001, Wildlife Action Plan Team 2006, www.natureserve.com

A narrative describing the specific improvements, blanks and adverse affects to migratory birds as shown in Table 6 follows.

The species that were left nearly blank, showing a benefit in one or two units are generally associated with mature or old-growth tree stands that don't occur in the proposed treatment units. In some cases, treatment would enhance a habitat component such as aspen retention or mature tree recruitment that might cause the species to begin using the area or remain.

The ducks and shorebirds listed might use Indian Creek Reservoir, Curtz and Summit Lakes as stopover habitat but won't be affected by the residual forest structure after treatment. The benefit of the two Bagley treatments for sage grouse has been discussed. Virginia warbler is a shrub related species and would benefit from having openings created and a more vigorous shrub understory. Rufous hummingbird is a riparian shrub related species that would benefit from treatments near water sources that would create a healthier shrub community. Red-napped sapsucker would be benefited by the retention of aspen as a result of treatment (www.natureserve.com).Gray vireo and pinyon jay have been discussed.

Virginia warbler, band-tailed pigeon and rufous hummingbird are a few of the migratory birds that can have a higher abundance in mistletoe infected tree stands (Bioscience 1991). Mistletoe treatment won't favor supporting this abundance but treatment of the small unit won't have much effect on local use. (Local being defined as the eastern slope of the Sierra Nevada range.)

Band-tailed pigeon is a mixed conifer associated species. This species would lose mixed conifer habitat. However, treatment would affect only 0.2% of the white fir that, along with Jeffrey pine, makes up mixed conifer in the Carson Watershed (Barker 2008). Continental populations of this species is down, attributed to snag removal and even-aged forest management (Floyd 2007). The proposed treatments aren't a significant enough impact to cause further decline in the Continental band-tailed pigeon population. Additionally, one unit would see mixed conifer planted. Others would see only thinning of mixed conifer which would enhance residual trees.

Lewis woodpecker use snags as well as deciduous trees near streamside for nesting. In one unit, public safety will take precedence over wildlife values as stated in the EA. Hazard tree snags may be felled in this unit. Although these might be good woodpecker habitat, public safety is paramount. The resource protection measures listed in the front of the document and description of ideal snags in the Appendices serve as mitigation for any impacts to this species nesting habitat in all other units in the short term. A minimum of 3 of the best quality snags per acre would be retained. In the long term, the retention of deciduous trees and reintroduction of natural fire would benefit this species.

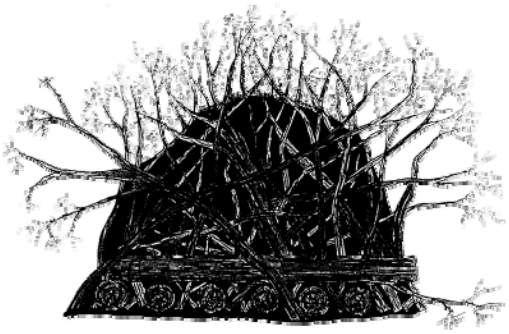
Research has shown that at treatment levels, borax entering open water won't affect aquatic species. It also indicates that at the levels proposed, there won't be an effect from terrestrial species direct ingestion or contact, or from indirect use of vegetation or invertebrates (USFS ND).

Impacts associated with the treatment process are different than impacts associated with residual habitat. Implementation impacts are short-term but may affect individuals of species whose habitat would be benefited in the long-term. Sage grouse, Virginia's Warbler, Gray Vireo, Pinyon Jay, Band-tailed Pigeon and Rufous Hummingbird would all be expected to nest in the treatment areas. Other migratory bird species of concern either don't have nesting habitat at the present time, or use the units for something other than nesting. Spring burning, mastication or hand cutting could disturb individual nesting birds of the species listed. Mitigation for treatment of the Bagley units has been written which would confine treatment times to late summer, fall or winter since the treatments are being done specifically to benefit grouse. Mitigation for the other species has been written to try to perform treatments from mid-summer through winter. However, because fuels reduction is the main goal of the treatment, the current year threat of catastrophic wildfire must be weighted against the loss of annual production for a minimal number of birds. If treatment had to be done during nesting season, only that year's production would be lost and that wouldn't be important to local populations nor would it cause changes in regional or Continental population trends.

APPENDIX H – Specifications for Wildlife Brush Piles, Snags/Dead Standing & Downed Logs

The following specifications describe the size and shape of the special features that would be retained and/or created to benefit wildlife species using the proposed project areas:

- Brush pile specifications would be as close to ideal as possible, i.e. 6-10 inch diameter logs placed parallel to each other one foot apart for the foundation. Branches and logs placed perpendicularly on top of the foundation. Smaller debris placed on top to form a mound or tepee shape. The structure should be about 15’ x 15’ x 8’. If possible, place near shrub patches.



Dead standing and down logs specifications would be as close to ideal as possible, i.e. 10” dbh x 10’ in P-J, 18” dbh x 20’ in Jeffrey Pine.

APPENDIX I - Soil Water and Air program Best Management Practices

The following best management practices (BMPs) are to be used to minimize soil erosion and protect water quality when completing forestry or hazardous fuel reduction projects. The management objectives of these projects are achieved by altering vegetation communities. Implementing the BMPs would minimize unnecessary surface disturbance and damage to residual vegetation that protects soils from erosion.

BMP 1: Schedule projects during low-impact period

Definition: Projects would be scheduled to avoid wet soil conditions. To prevent soil compaction, rutting, and erosion, equipment will not be operated on sites with wet soils. Wet soils are defined as those soils with sufficient moisture in the surface six inches to exhibit plasticity, which can be determined in the field by kneading a sample in the hand until a cohesive ball of soil is made. Drier soils typically will be too hard to knead, will crumble, or will be granular without a well-defined structure (e.g., sands).

Purpose: Timber and fuels projects can cause soil disturbance and damage non-target plants that provide ground cover. BMP 1 restricts projects to periods that would minimize the likelihood of these impacts.

Applicability: This practice would apply to any project site when significant soil surface disturbance could occur, but is especially important on fine-textured soils and soils with well developed structure, such as loams. These soils are especially prone to compaction, rutting, and similar impacts.

Planning Criteria: If contracting or scheduling in-house labor, plan to complete work during periods when soils are typically dry. Fall and winter are the preferred seasons for fuels projects due to the low risk of wildfire, BLM budget cycles, and greater availability of fire personnel. Regional precipitation primarily occurs in winter, however, so flexibility should be provided in the work schedule to avoid wet conditions.

BMP 2: Minimize and mitigate surface disturbances

Definition: Methods that avoid unnecessary surface disturbance would be chosen.

Purpose: These management practices would reduce or mitigate surface disturbances which can lead to soil erosion in many ways, including (1) directly detaching and transporting soil, (2) exposing soil to erosion by reducing non-target vegetative ground cover, (3) compacting soils and reducing infiltration, and (4) rutting that concentrates overland flow.

Applicability: BMP 2 would apply to any project site where significant surface disturbance could occur, but is especially important on fine-textured soils and soils with well developed structure, such as loams. These soils are especially prone to compaction, rutting, and similar impacts.

Planning Criteria: Site access should minimize the amount and intensity of disturbance associated with vehicle traffic and off-road travel. Choose appropriate treatment methods to minimize surface disturbance and to avoid impacts to non-target plants when felling trees, operating machinery, and performing other tasks.

Methods:
1. Minimize the area and intensity of disturbance. For example, a road that switchbacks up a slope would disturb a greater area, but have less impact than one directed up and down a slope.
2. Avoid repeated vehicle and equipment traffic on areas that are prone to soil and vegetation impacts.
3. Plan vehicle routes where they would do the least damage, such as rock outcrops or coarse-textured soils that resist compaction.
4. Travel and conduct treatment operations along the contour of the slope to the extent possible to avoid channelizing overland flow.
5. When leaving slash or wood chips onsite, scatter over disturbed areas to protect exposed soils from raindrop impact.

BMP 3: Avoid sensitive riparian areas, wetlands, and drainages

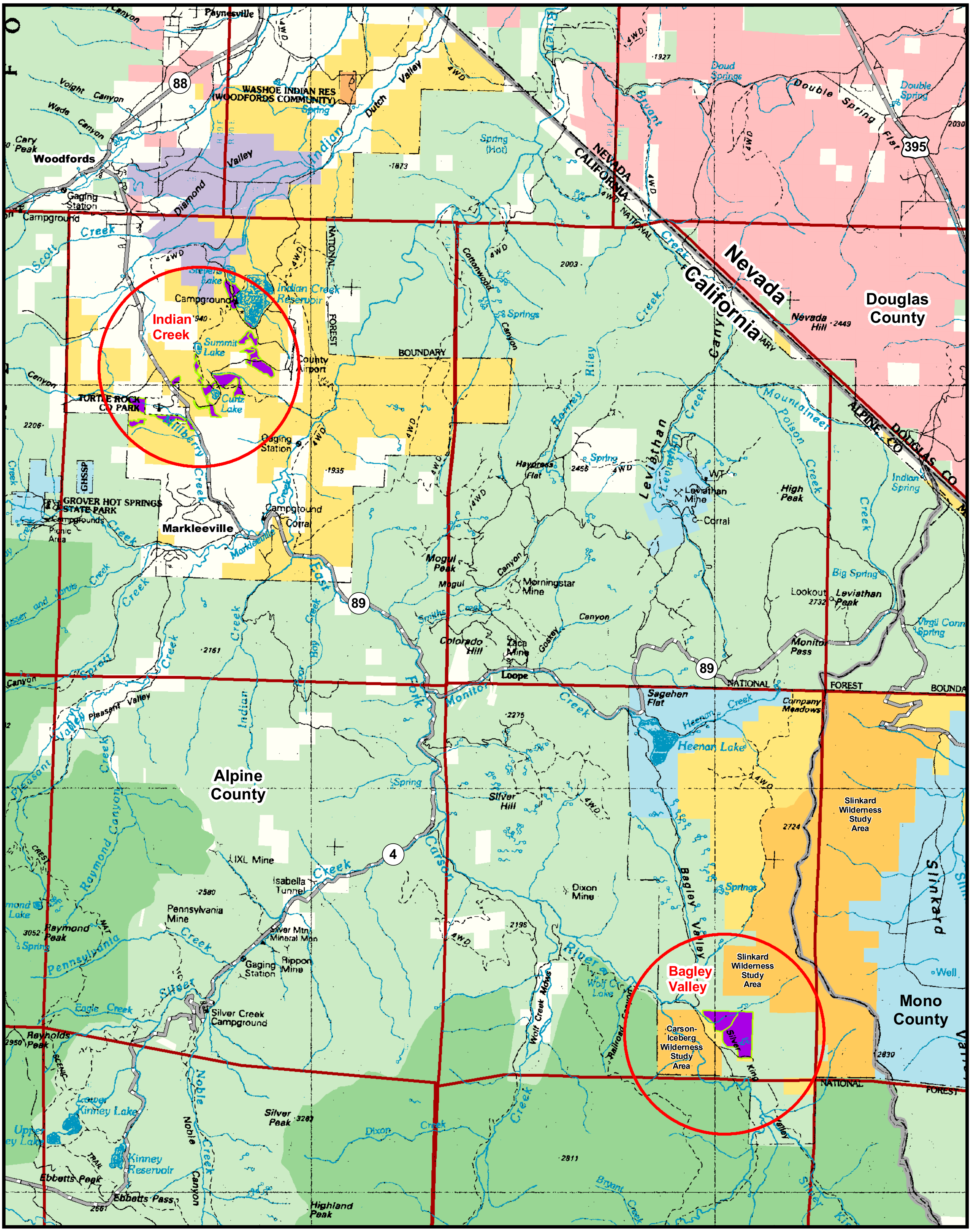
Definition: Exclude treatment from sensitive riparian areas, wetlands, and drainages, including an adequate buffer where appropriate. The presence of water in these areas could be ephemeral, so BMP 3 might be necessary where no surface water is present during project planning and implementation. Note that BMP 3 could be modified or limited for projects that target plants in these areas (e.g., removing juniper near a spring to reduce competition with riparian species).

Purpose: BMP 3 is designed to protect sensitive riparian and wetland areas, and to prevent sediment deposition in drainages where the sediment could be transported to other water bodies.

Applicability: This practice could apply to any project where an identifiable drainage exists, but is especially important for perennial waters, riparian and wetland areas, and where a drainage leads from the project area to a water body.

Planning Criteria: Survey the project area to identify riparian and wetland areas, and drainages. Evaluate the potential for sediment to be generated by the project and delivered to offsite water bodies. Determine what areas would be left untreated to protect these resources. Size of buffers would depend on project objectives and site conditions, such as soil type, vegetative cover, slope, and aspect.

Methods:
1. Mark buffer areas to be left untreated or where treatment would be limited.
2. Be sure work crews have clear instructions on the meaning of any markers.
3. Map avoidance areas in GIS to facilitate planning and communication with work crews.
4. When necessary, have a project inspector onsite during operations to instruct crews on avoidance areas.
5. If avoidance is unfeasible, use portable bridges or other devices to prevent impacts.
6. Do not perform equipment maintenance onsite where fuel, lubricants, or other contaminants could enter water bodies.

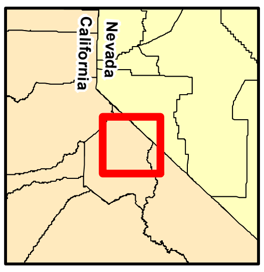

R19E
R20E
R21E
R22E
T 11 N
T 10 N
T 9 N
T 8 N
Paynesville
88
Voight Canyon
Wade Canyon
Cary Peak
Woodfords
WASHOE INDIAN RES (WOODFORDS COMMUNITY)
Dutch Valley
Diamond Valley
Gaging Station
Campground
Scott Creek
Indian Creek
Campground
Summit Lake
Curtz Lake
County Airport
TURTLE ROCK CO PARK
Millberry Creek
GHSSP
GROVER HOT SPRINGS STATE PARK
Campgrounds
Picnic Area
Markleeville
Campground
Corral
BOUNDARY
NATIONAL
FOREST
Cottonwood Canyon
Springs
Spring (Hot)
Doud Springs
Bryant
Double Spring Flat
Double Spring
395
NEVADA
CALIFORNIA
Nevada
California
Douglas County
Nevada Hill
ALPINE CO
DOUGLAS CO
Riley
Barney
Mountaineer
Poison Creek
Hayspress Flat
Spring
Leviathan
Leviathan Mine
Corral
High Peak
Indian Spring
Big Spring
Lookout
Leviathan Peak
Virgil Conn Spring
Monitor Pass
Mogul Peak
Mogul
Morningstar Mine
Canyon
Colorado Hill
Zaca Mine
Goskey
Loope
89
East Fork
Monitor Creek
Sagehen Flat
Heenan Creek
Heenan Lake
Company Meadows
FOREST
BOUNDA
Alpine County
Pleasant Valley
Spratt Creek
Indian Creek
Raymond Canyon
Raymond Peak
Pennsylvania Creek
Pennsylvania Mine
IXL Mine
Isabella Tunnel
4
Silver Mtn Mineral Mon
Gaging Station
Rippon Mine
Silver Creek
Silver Creek Campground
Eagle Creek
Silver Hill
Dixon Mine
Carson River
Bagley Valley
Slinkard Wilderness Study Area
Slinkard
Mono County
Well
Wolf Cr Lake
Wolf Creek Mdws
Railroad Canyon
Carson-Iceberg Wilderness Study Area
Silver King
NATIONAL
FOREST
Reynolds Peak
Lower Kinney Lake
Upper Kinney Lake
Kinney Reservoir
Ebbetts Peak
Ebbetts Pass
Noble Creek
Noble Canyon
Silver Peak
Dixon Creek
Highland Peak
Bryant Creek

Legend

Land Status

- Bureau of Land Management
- Bureau of Land Management Wilderness Study Area
- Bureau of Reclamation/Withdrawal
- Native American Reservation
- Native American Trust Land
- Forest Service
- Forest Service Wilderness
- South Tahoe Public Utility District
- State
- Private

- County Line
- Major Hwy
- Proposed Treatment Area



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United States Department of the Interior
Bureau of Land Management (BLM)
Carson City Field Office
5665 Morgan Mill Road
Carson City, NV 89701

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Map 1 - Treatment Units, Overview

3/12/08

R20E

T 10 N

Campground West
Campground East
Campground
Campground Road
Campground South
Reservoir
Airport Road North
Airport Road Central
Airport Road South
Summit Lake
Indian Creek 4
Summit Ridge
Carson River Trail
Curtz Lake
Airport Road Bend
Vegetative Trail
Millberry 2 North
Millberry
Millberry 2 South
Hwy 89 West

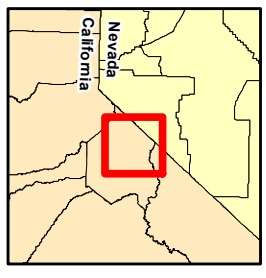
R20E

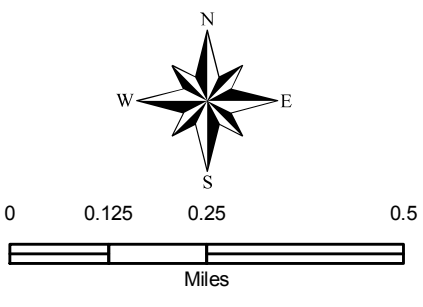
Legend

Land Status

- Bureau of Land Management
- Forest Service
- South Tahoe Public Utility District
- Private

- Structure
- Proposed Treatment Area





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Map 2 - Treatment Units, Indian Creek

3/12/08

R21E

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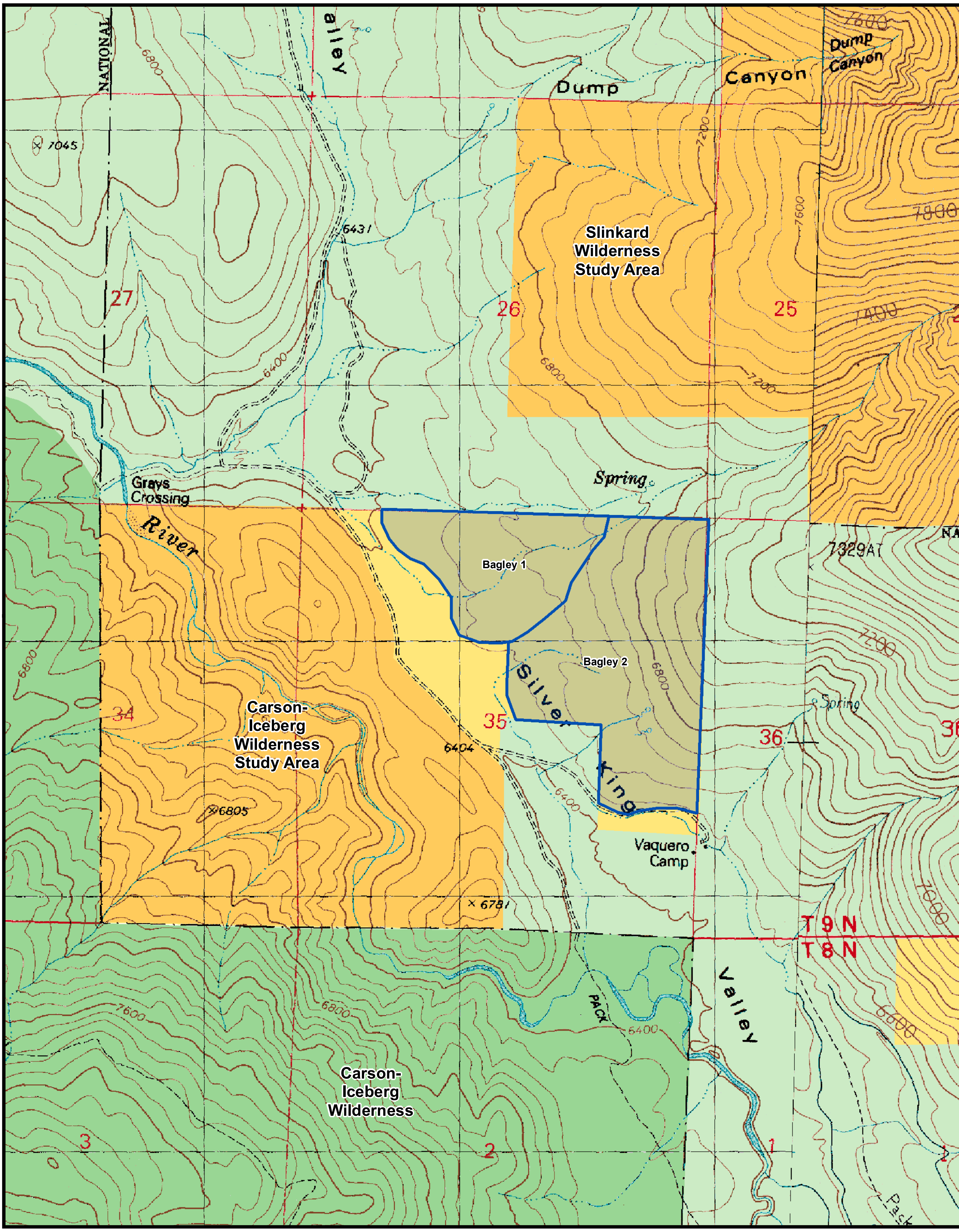


T 9 N

T 8 N

T 8 N

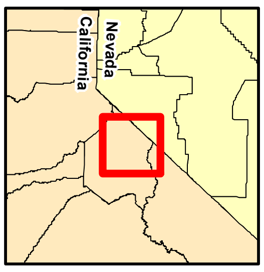
R21E

Legend

Land Status

- Bureau of Land Management
- Bureau of Land Management Wilderness Study Area
- Forest Service
- Forest Service Wilderness

Proposed Treatment Area



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Map 3 - Treatment Units, Bagley Valley

3/12/08

R20E

T 10 N

T 10 N

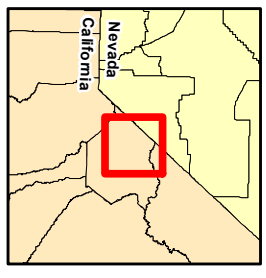
R20E

Legend

Land Status

- Bureau of Land Management
- Forest Service
- Forest Service Wilderness
- South Tahoe Public Utility District
- State
- Private

Past BLM Fuels Treatment Area, 1997-2007



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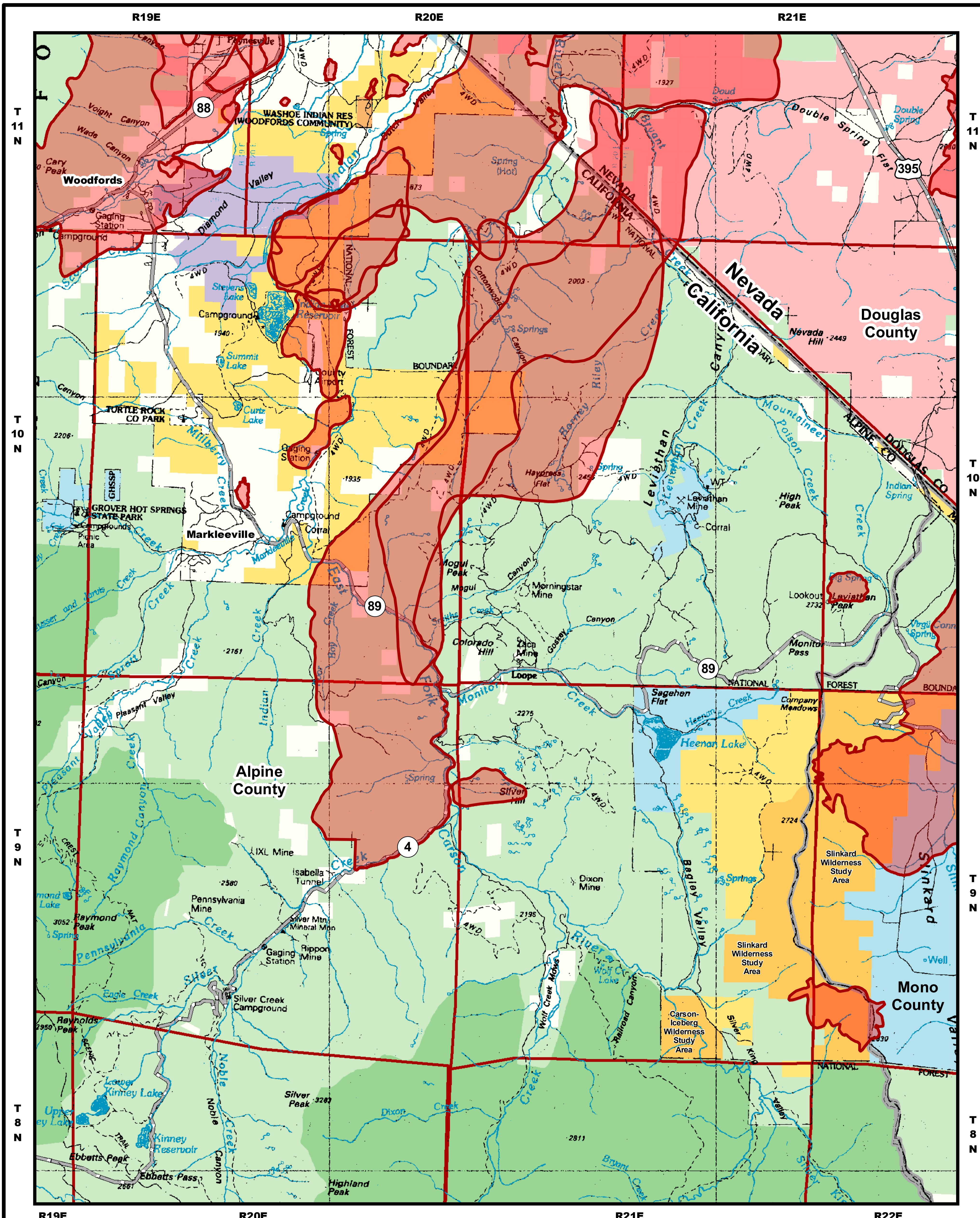
Map 4 - Fuels Treatment History

3/12/08



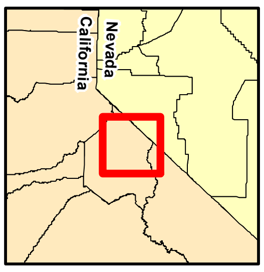
Legend

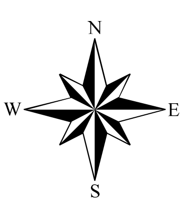
Land Status

- Bureau of Land Management
- Bureau of Land Management Wilderness Study Area
- Bureau of Reclamation/Withdrawal
- Native American Reservation
- Native American Trust Land
- Forest Service
- Forest Service Wilderness
- South Tahoe Public Utility District
- State
- Private

- County Line
- Major Hwy
- Past Large Wildfire, 1947-2007

Past large wildfire history incomplete. Only fires for which data was available included.





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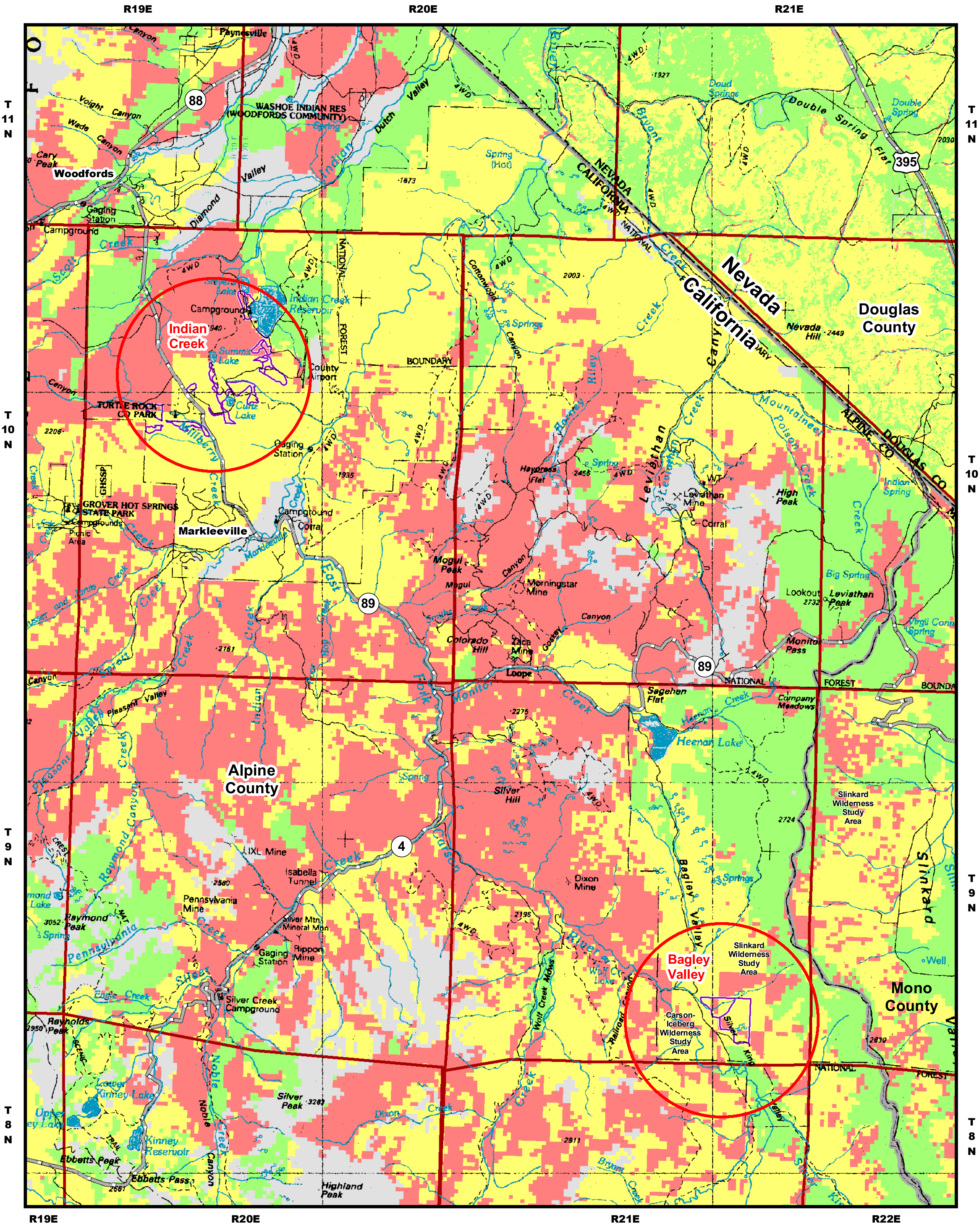
Map 5 - Large Wildfire History

3/12/08



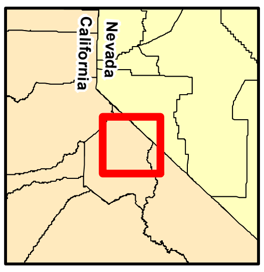
Legend

Condition Class

- Condition Class 1 - Vegetation and fire attributes intact and functioning. Risk of losing key ecosytem components low.
- Condition Class 2 - Fire frequencies departed by one or more return intervals resulting in moderate changes in fire and vegetation attributes. Risk of losing key ecosystem components moderate.
- Condition Class 3 - Fire frequencies departed by multiple return intervals resulting in dramatic changes in fire and vegetation attributes. Risk of losing key ecosystem components high.
- Barren, Urban, Agriculture

- County Line
- Major Hwy
- Proposed Treatment Area

California Department of Forestry. 2003. Fire and Resource Assessment Program. Fire Regime Condition Class.



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Map 6 - Condition Class

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